A CHILTON PUBLICATION

Iron Age

THE NATIONAL METALWORKING WEEKLY

April 8, 1954

Future Metalworking Markets

Facing page 66

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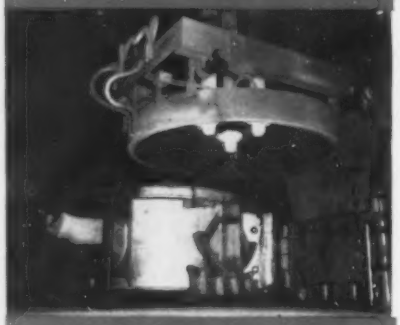
WHITING

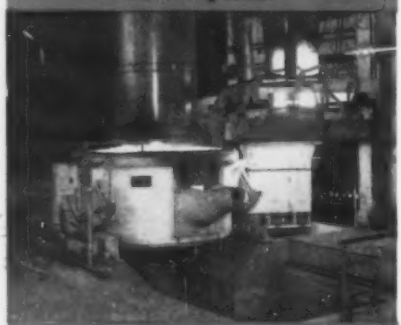
Hydro-Arc

ELECTRIC FURNACES

HERE'S THE "Pace-Setter" IN ELECTRIC MELTING!



Hydro-Arc furnace with roof lifted and swung aside.



An "orange-peel" drop bottom bucket fills furnace with one drop.

"Business End" of HYDRO-ARC Furnace. Servo Units used to raise or lower electrode arm.

You ask, "What electric furnace offers the most advantages?" The answer is WHITING HYDRO-ARC because of its important, advanced engineering principles! To name a few:

1. **The Hydro-Arc Automatic Electric Clamp,** pioneered by Whiting, saves up to 90% of furnace down-time for slipping electrodes. It also means an 8% increase in operating time and production . . . and in addition, the elimination of the hazardous electrode slipping operation.

2. **The Unique Hydro-Arc Top Charge,** a load factor improvement, reduces furnace down-time for recharging to only a few minutes. Because of its sound, basic simplicity, limit switches are eliminated and maintenance is held to a minimum.

3. **The Hydro-Arc Air-Counterbalanced Hydraulic Electrode Positioning Equipment** assures less electrical energy and electrode consumption as well as improved metallurgical control and longer refractory life.

Write today . . . for 40 page bulletin FY-168. It completely describes Whiting Hydro-Arc Electric Arc Furnaces!

WHITING CORPORATION

15601 Lathrop Avenue, Harvey, Illinois

MAYARI R
IS EASY TO WELD

One of the special advantages of Mayari R is that you can weld it by all the usual methods. The development of this high-strength, low-alloy steel closely followed the development of welding itself, and great care was taken to make Mayari R easy to weld. Its low carbon content of .12 max insures maximum weldability.

Whether you weld Mayari R by the electric-resistance, automatic-submerged-arc, electric-arc, or gas-welding process, you can use the same general procedures as you would with ordinary structural steel. No need for special equipment, and good welding speeds can be maintained.

Classed as a non-air-hardening steel, Mayari R shows no appreciable hardening from usual welding temperatures. For the general run of welding operations, no preheat or postheat is required. As with ordinary carbon steels, assemblies or structures subject to fatigue, dynamic stresses or severe impact should be stress-relieved after welding.

If you have some special questions on the welding of Mayari R, let us hear from you. And for your files, you should have our Mayari R Catalog 353. Phone or write the nearest Bethlehem office for a copy.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

Mayari R *makes it lighter... stronger... longer lasting*

The Iron Age

Digest of the Wee

Vol. 173, No. 14, April 8, 1954

★Starred items are digested at the right.

The Iron Age, published every Thursday by CHILTON CO. (INC.), Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1932, at the Post Office at Philadelphia under the act of March 3, 1879. $5 for 1 year, $8 for 2 years in United States, its territories and Canada; other Western Hemisphere Countries, $15, other Foreign Countries, $25 per year. Single copies, 35¢. Annual Review Issue, $2.00. Cables: "Ironage." N. Y.

Address mail to 100 E. 42 St., N. Y. 17, N. Y.

NEWS & MARKETS

PLANT DISPERSION BEST H-BOMB DEFENSE — P.
With urban industrial centers virtually helpless again hydrogen bomb attack, plant dispersion is coming for far more serious attention by everyone. Office Defense Mobilization is admittedly studying new i centives and allied problems. Meanwhile stockpiling being pushed. Transport a major problem.

STEEL PROFITS TOP '52 BY WIDE MARGIN — P. 1
Virtually every sales and production record in the ste industry was rewritten in 1953—but not net incom The annual IRON AGE financial analysis shows ear ings were more than 4 pct below the 1950 high. Factor included price controls, heavy taxes, higher labor cost heightened competition.

COMPETITION TOUGH IN TRUCK SALES RACE — P. 1
Truck production down almost 20 pct after 2 year of all-out competition. Makers tempt buyers with flock of new models, introduce new V8 engines, aut matic transmission options, power steering, plenty style and driver comfort features. Chrysler gives Dodge Truck Div. new autonomy, franchise choices.

EXCESS TAX CUT IMPACT NOT TOO HEAVY — P. 1
Despite the hoopla, the $999 million excise tax c won't hit the economy like an H-bomb. Splitting down increases spending power an estimated 32¢ p family per week—hardly enough to put two Cadill in every garage. But excise cuts will add vigor to oth consumer spending stimulants now at work.

AUTO DEMAND WON'T SPARK STEEL UPTURN — P. 1
Steel industry shouldn't expect any big second quart shot in the arm from auto buying. Ford and GM, t big producers, have actually been increasing inve tories while outdistancing the field in production. Bo have bought extra tonnage as a hedge against a p sible strike. Detroit storage areas are loaded.

STOCKPILING MAY TIP THIRD ROUND DECISION—P. 1
As well as jolting the slower metals markets, revis stockpile goals may tip the decision in favor of a thi round aluminum expansion. Capacity right now plenty for all civilian, military and stockpile needs but a new emergency would certainly drop the botto from under civilian aluminum users.

in Metalworking

Feature Issue

ENGINEERING & PRODUCTION

MPROVED FORGING METHODS SAVE STEEL — P. 145
se of powerful, vertical all-steel presses in place of nventional pierce-and-upset, horizontal draw bench s greatly increased production of large hot-forged rtillery shells. In addition to manpower saved, many achine hours have been eliminated. Savings to 35 lb steel per 155 mm shell are possible.

TAINLESS SPRINGS GIVE LONG SERVICE — P. 149
ype 301 stainless steel springs are giving superior rvice life in installations requiring flexing at high eeds and over long periods of time. In one model of ddressograph machine, these springs replace springs ade of special imported spring steel. Other domestic eels were tried but the stainless was best.

EW SYSTEM CUTS PICKLE DISPOSAL COSTS — P. 150
ower costs for waste pickle liquor disposal are pos- ble with a newly developed waste disposal system. perating costs range from 1.8 to 2.0 cents per gallon waste liquor, depending on acid strength and cost neutralizing agent. Sludge lagoons are eliminated d waste liquids are acceptable to natural streams.

IMPLE TEST MEASURES QUENCHING POWER — P. 154
n eccentric hardenability test specimen is the basis a simple test for determining the effects of agitation hot salt baths. Specimens are easy to prepare, mple to use and results are evaluated in practical rms. Hardnesses are plotted against section thick- sses to compare quenching power of the baths.

IST LUBRICATION CUTS OPERATING COSTS — P. 158
arked savings can be achieved by the use of mist-type brication units. One installation, using an oil-kerosene ixture on grinding wheels, has increased wheel life four to six times. Fine oil spray helps prevent olant-lubrication contamination on screw machines. il consumption measures ounces per day.

EXT WEEK — LOW-COST COATING PROTECTS STEEL
ast, low-cost application of a new nickel-phosphorous ating is claimed to give mild steel corrosion resistance mparable to some stainless steels. It can be applied brushing, dipping or spraying. An oxide of nickel reduced on the coated surface. Basic ingredients of e mixture are inexpensive.

METALWORKING'S FUTURE MARKETS

Despite temporary setbacks, a huge expansion for metalworking industries is immediately ahead. To help you know what to expect so your firm can share in the expansion, The Iron Age has prepared a 32-p. Special Report on "Metalworking's Future Markets" (starts on p. 67).

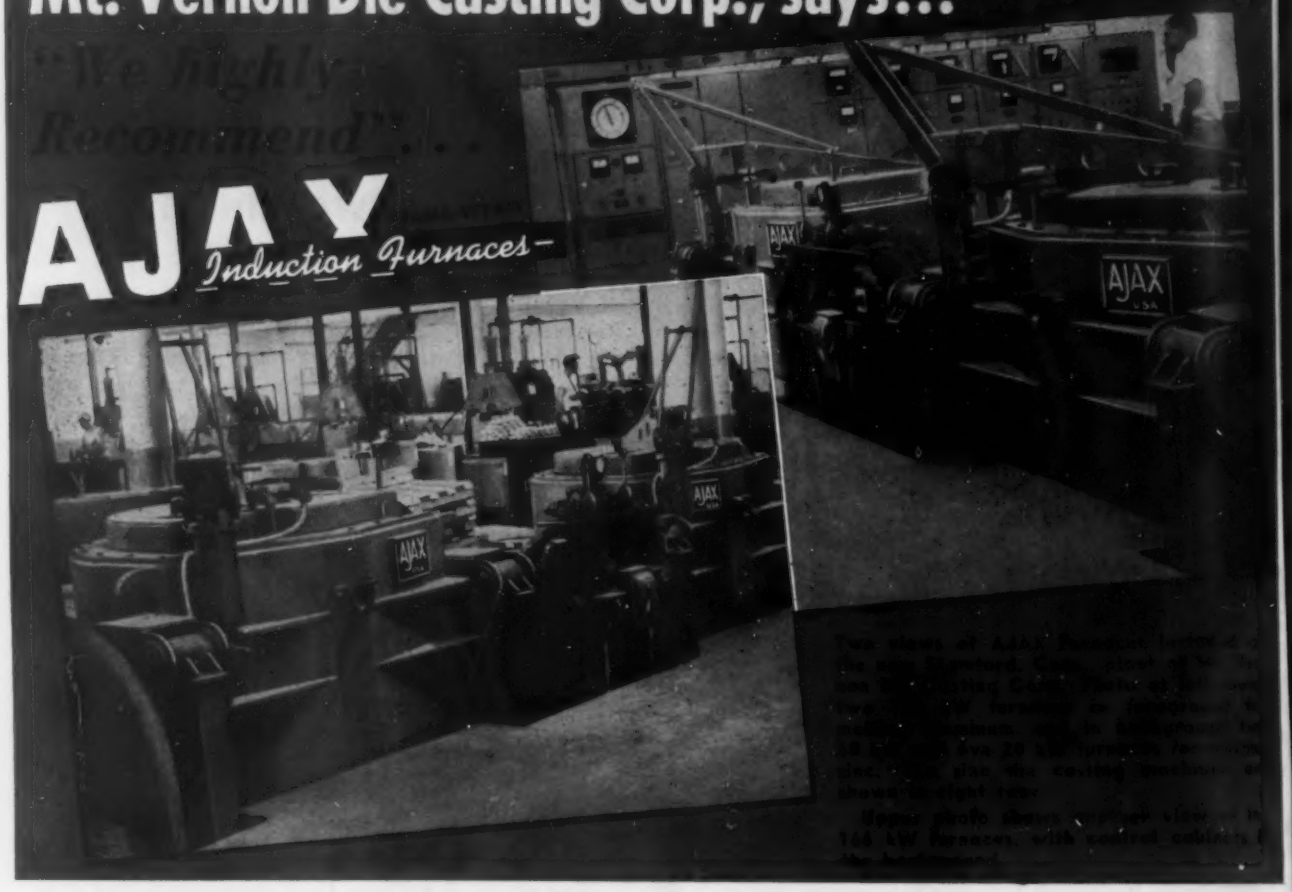
Top brains in government and industry were called on to analyze the general business outlook, population trends, market future for specific metals.

See Metalworking's Future Markets — P. 67

Mt. Vernon Die Casting Corp., says...

"We highly Recommend"...

AJAX *Induction Furnaces*—



After a most satisfactory experience of more than five years with AJAX *low frequency* Induction Furnaces in their Mt. Vernon, New York plant, this company has now installed the furnaces shown above in their new modern plant at Stanford, Conn. "We are convinced," they state, "that economy of operation makes this type of furnace well worth while. We intend to continue to install them till all our die casting machines are fed by AJAX furnaces."

AJAX induction melting and holding furnaces are finding wide acceptance in the American die casting industry. Experience has shown that they greatly improve the overall performance. In particular, the absence of fumes and reduction of radiant heat give greater comfort to the operators. Electricity is one of the few commodities which have not increased in price in recent years.

Agitation, due to internal electrical stirring, insures uniform temperature and homogeneous mixing of the ingredients. Since linings are made of inert refractories, they cannot contaminate the melt. Temperature control is entirely automatic and keeps the molten mass within $\pm 5°F.$, holding the metal at the lowest feasible casting temperature.

Amazingly low maintenance is the rule. Some furnaces operate for as long as 7 years without renewal of refractory lining. Reject and metal losses are extremely low.

AJAX ENGINEERING CORP., TRENTON 7, N. J.

AJAX TAMA-WYATT — **INDUCTION MELTING FURNACE**

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., The Ajax Hultgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax Wyatt Induction Furnaces for Melting

THE IRON AGE

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Indexed in the Industrial Arts Index and the Engineering Index.

ABC AUDITED PAID CIRCULATION

Society of Business Magazine Editors

BPA Business Publications Audit

NBP National Business Publications

Parity For All

(A Fantasy)

WASHINGTON (Nationalized Press)—The Senate passed and the President signed today the highly controversial steel price parity bill. This action is expected to speed pressure from other groups for similar treatment.

Congressman Joe Magarac, D., Homestead, Pa., introduced the bill in the House where it was passed quickly several weeks ago. It is believed Mr. Magarac intended the bill as ammunition for more liberal annual wage provisions.

Opposition to the bill in the Senate came from the agricultural block. This was said to be ironic in view of the parity assistance for wheat, corn, eggs, milk, butter, cheese and beef.

The Assn. of Iron & Steel Producers and the National Steelworkers' Union were said to have mapped important passages of the new steel parity legislation.

The bill requires the government—upon certification of the Commerce Dept.—to make subsidy payments to steel firms whose operating rate has fallen below the break even point. The latter may vary with different firms as the ratio of their capacity to total capacity varies and as the ratio of new equipment to old equipment varies.

In addition to the foregoing adjustment there is another feature of the bill. The price of steel must be measured against how much wheat and beef can be purchased with one ton of steel. The accepted level for the composite price of steel (as reported in THE IRON AGE) is the average for 1953.

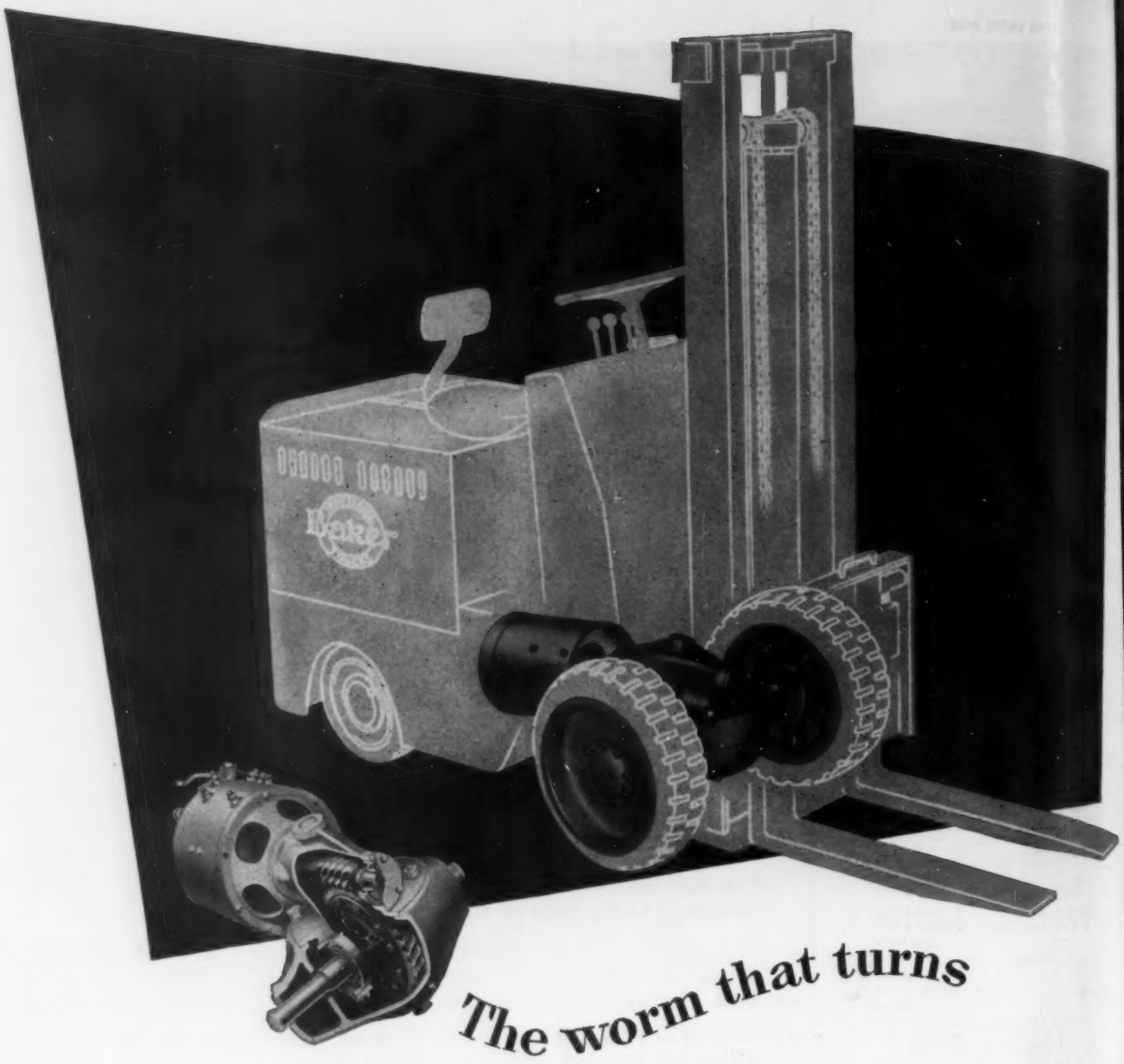
Once the price of steel falls below 75 pct of the wheat-beef relationship the government must support the price of steel. But in addition to this the government must pay $1 a ton for each point a company's output drops below the break even point—the latter to be determined by the Commerce Dept. It was this feature of the bill which drew the most fire in the Senate. Some referred to it as double parity for the same steel.

Steel purchased by the government will be stockpiled in the same manner as butter, cheese, milk and beef except for refrigeration.

Latest reports indicate that demands for similar treatment are pouring into the Capital. Some wags have the country headed for parity for all and everything.

Tom Campbell

Editor



The worm that turns

...with ever-increasing efficiency

Baker Industrial Trucks use worm gearing in their drive axles, and here's why:

Industrial truck drive systems are called on for punishing, heavy-duty service. Truck operation is comparable to driving an overloaded auto constantly in low gear. Industrial truck transmissions change speed or direction as often as 1800 times during an eight-hour day.

The necessary gear reduction from motor shaft to drive wheels can be accomplished in several ways. The two most common are a gear train of two or more steps with spur or bevel gears, or single-step worm gearing.

The first means more moving parts, more maintenance, and compounded friction losses for each successive step-down. Development of the highly efficient involute worms, new lubricants and new tooth profiles, on the other hand, produce worm gearing efficiencies up to 92%—with fewer components.

One more point: Worm gearing actually increases efficiency with wear since the worm continuously regenerates the "ideal" tooth profile on the worm wheel. In spur or bevel gearing, efficiency declines progressively as teeth wear and lost motion develops.

For more detailed information on Baker Fork Truck features, write for 4-color sketch book—Bulletin 64. The BAKER-RAULANG Company, 1227 West 80th Street, Cleveland 2, Ohio.

Baker
industrial trucks

Dear Editor:

Letters from readers

Self-Made Man

Sir:

May we reproduce your excellent editorial "The Self-Made Man" which appeared in the Mar. 18 issue?

We wish to distribute it to our management personnel.

M. A. LONDON
Training Director
Royal Typewriter Co., Inc.
Hartford

Ultrasonic Soldering

Sir:

The first item under THE IRON AGE Newsfront in the Mar. 18 issue mentions a company that has developed ultrasonic soldering of aluminum.

If possible, we would appreciate receiving the name of this company and any other information you might be able to give us regarding the development of this process.

O. C. HEFFNER
Factory Manager
Hoover Co.
North Canton, Ohio

Further information may be obtained from Aeroprojects, Inc., S. Matlack St., West Chester, Pa.—Ed.

Automated Crankpin Grinding

Sir:

Referring to the Mar. 25 issue, p. 69, item on automated grinding of crankpins, kindly give me the name of the firm who makes this machine.

W. W. McKAIG
Cumberland Steel Co.
Cumberland, Md.

More details may be obtained from the Norton Co., 50 New Bond St., Worcester 6, Mass.—Ed.

Spiritually Speaking

Sir:

Permit me to congratulate you on the wonderful editorial "God and the H-Bomb" in the Mar. 25 issue. If all the papers, periodicals and magazines in this and other free countries would follow the ideas conferred in this editorial, I am sure much could be accomplished.

P. IGOE
Igoe Bros., Inc.
Newark, N. J.

Distributors List

Sir:

A few days ago we purchased some copies of THE IRON AGE "Directory of Tool Steels." We do not find Hill-Chase & Co. listed among the distributors of tool steel in the group named at the beginning of the book.

We have distributed Bethlehem tool steels in the Philadelphia trading area for nearly 20 years and have attained some prominence as a tool steel source. We have enjoyed the full support and backing of the Bethlehem Steel Co. as their exclusive tool steel distributor for the area.

Would it be possible for you to include us in your new edition?

A. E. PAUSSER
Advertising Manager
Hill-Chase & Co.
Philadelphia

The distributors listed at the beginning of the directory are only those who market tool steels under their own brand name.

Friction Sawing

Sir:

We would greatly appreciate receiving a reprint or tear sheet of the article entitled "Friction Sawing—Cuts Off High Costs" which appeared on p. 152 in the Feb. 18 issue.

W. F. PARSONS
Carborundum Co.
Niagara Falls, N. Y.

Shell Molding

Sir:

We would like permission to reprint the article, "Shell Molding Brings New Foundry Era," which appeared in the Jan. 28 issue.

C. V. PICKERING, JR.
Union Carbide International Co.
New York

Operations Research

Sir:

Would you please send me six tear sheets of the article "Operations Research Means . . . Put Your Problems on Paper" in your Feb. 18 issue.

N. R. KIDDER
Mgr., Market Research & Sales Analysis Div.
Jones & Lamson Machine Co.
Springfield, Vt.

Lone Star Steel Company selects Selas Furnaces to . . .

REDUCE TUBE HEAT TREATMENT FROM 21 MINUTES TO 66 SECONDS

Largest Selas Radiant Heat Tube Normalizing Furnaces Speed Output . . . Save Space

Instead of six minutes for heating and fifteen minutes for holding, considered necessary with conventional heat treating equipment, Lone Star engineers selected Selas radiant heat furnaces. This meant tube normalizing on a through-line basis that took only 66 seconds . . . reduced space required . . . tied the heat treating operation directly to the tube mill at mill speed.

There are two Selas radiant heat furnace lines for normalizing at the Lone Star, Texas plant:

No. 1 Furnace line heat treats 90 tons per hour of welded tubing (4½″ to 16″ O.D.) at speeds of 40′ to 90′ per minute.

No. 2 Furnace line heat treats 45 tons per hour of welded tubing (1.90″ to 6.625″ O.D.) at speeds of 75′ to 180′ per minute.

This is just one of many examples of how Selas engineers designing, manufacturing and applying Selas radiant heat processing equipment have speeded up metal working . . . assured precise uniformity . . . improved product quality. Let them help you. Write for complete details on this and other Selas installations.

SELAS

CORPORATION OF AMERICA

PHILADELPHIA 34, PENNSYLVANIA

Heat Processing Engineers for Industry • Development • Design • Manufacture

Fatigue Cracks

by William M. Coffey

OUR FIRST NOVEL

Everybody who can read secretly harbors the thought that he can write, too. We all know this. Show us someone who doesn't read a novel or short story without saying to a wife ". . . 'ya know the finest life a man can have? Be a writer. Look at this story I've been reading. 'Ya know what these guys make? Thousands — and they all lie in hammocks and sip tall, cool ones. The first couple of days I have free I'm writing a story. We'll be fixed for life. 'Ya know? Lessee, two stories a week at $250 per. Lessee. Something like $50,000 a year. We'd get by."

We are no exception. But we *can* write. Been writing this thing for a year and a half. Found our 26th reader just yesterday. But ever since the time we found our *11th* reader, we've had bigger ambitions. Write a real novel—get some of that dough and hammock life.

Had a few free hours last week —and started our novel. Entitled *Blue Fantasia*. Here's the first chapter:

BLUE FANTASIA

(A psychological novel with Freudian complexes)

Chapter 1

"See the big cow," said Dickie.
"I see it," said Patty.
"It is a p-r-e-t-t-y cow," said Mother.
"Oh?" said Father.

* * *

"See the red boat," said Patty.
"I see it," said Dickie.
"It is a b-e-a-u-t-i-f-u-l boat," said Mother.
"Oh?" said Father.

* * *

"The dog is in the yard," said Mother.
"It is a b-r-o-w-n dog," said Patty.
"It is my dog," said Dickie.
"Oh?" said Father.

* * *

"I go to school," said Dickie.
"I am in the second grade," said Patty.
"We like our t-e-a-c-h-e-r," said Dickie and Patty.
"You are a good boy, John," said Mother.
"You are a good girl, Sally," said Mother.
"Oh?" said Father.

* * *

"I love Dickie," said Patty.
"I love Patty," said Dickie.
"I love Father," said Mother.
"Oh?" said Father.

"Mr. Coffey, as a thrice-time winner of the Pulitzer Prize, what is your advice for young, ambitious writers just starting out?"

"The hardest job is just to start. Half the battle. Figure out your plot.. Then sharply define your characters. After that the story starts to flow. Practically writes itself. Please . . . rock it gently, very gently."

Inside The Iron Age

All the talk these days seems to be about the H-bomb. Just want you to know that Admiral Lewis L. Strauss (AEC Chairman) and Tom Campbell (IRON AGE Editor) look at this thing eye to eye.

Tom said in his editorial of March 25—God and the H-Bomb —" . . . we can just as easily build a bomb with the impact of 100 million tons of TNT . . . we can increase the (damage) area to any mileage we want . . . we can eliminate any major industrial center with one well-placed H-Bomb . . . "

The Admiral said at the President's news conference *two weeks later* " . . . it can be made as large as you wish . . . large enough to take out a city."

. . . and Tom didn't even see the thing explode. Couple of comforting fellows.

Puzzlers

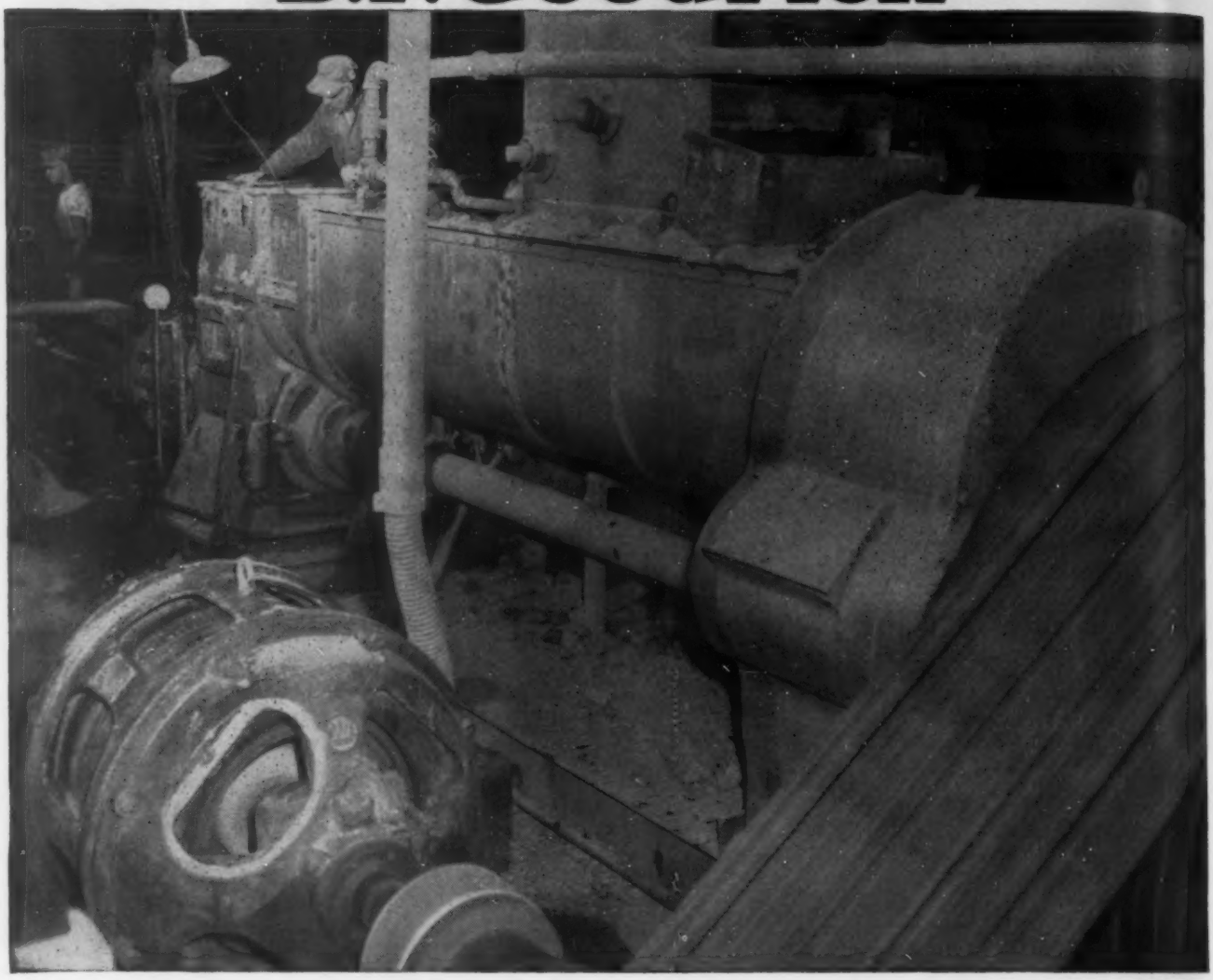
John Herb says the answer to his rotating flywheel puzzler is 9000 ft. Gus Alsterlund is the only one who hit this one on the nose. However, we received a variety of answers from William Gluntz, Jr. (9120 ft.), Emmerich Y. Olah, (8971 ft.), Howard Schwartz (20,-250,000 ft.), George Pascoe (8775 ft.) and Gordon McMillin says "infinity." Before passing judgment we're going to ask John Herb to send us details on his solution. We'll report back when we hear from John.

New Puzzler

A man starts out from a point on the equator, travels northeast by geographical compass (points at all times toward North geographic pole), correcting his route at each step of the way. Assuming that the earth is a perfect sphere and that our man walks with equal facility on land and water, the problem is: Where does he end up? How far will he have gone when he gets there? Or will he ever get there?

Many thanks to R. O. Whitaker.

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER



From 10 days to two years— with B. F. Goodrich Grommet belts

SEVERAL years ago when that electric motor was rewound, it developed more horsepower than was thought possible. Then the V belts, selected by using the rating on the motor plate, couldn't pull the load. They slipped, squealed, lasted 10 days. The job was too big for 15 ordinary belts, and it would cost $300 for new belts and sheaves. Even more costly would be the several days' loss in production.

Then a B. F. Goodrich distributor studied the drive, and said that the present sheaves could be used with the new 40% stronger, high-capacity Grommet V belts. They were tried. Instead of lasting only 10 days, the fifteen high-capacity belts have been in use over two years now, and are still going strong. Here's why:

40% stronger—Only with grommet construction is it possible to increase the number of cords reinforcing a V belt and still retain flexibility and resilience. Grommets are cord loops made like giant twisted cables except that they're endless. The B. F. Goodrich high-capacity V belt carries a 40% higher horsepower rating because it's built with larger grommets, having 40% more tensile strength.

Less stretch—Comparison tests on identical drives show that other V belts stretch at least 65% more than the BFG high-capacity. Actually, the Grommet is the only high-capacity belt that doesn't stretch enough to affect the efficiency of the drive.

Longer lasting—All V belts have load-carrying cords but only the B. F. Goodrich belt has grommet construction with its greater strength, less stretch, and longer life. Talk to a BFG distributor. Find out how you, too, can make important savings in belting, production and maintenance costs with the 40% stronger high-capacity Grommet V belt. *The B. F. Goodrich Company, Dept. M-211, Akron 18, Ohio.*

Grommet—T. M. The B. F. Goodrich Co.

B.F.Goodrich
INDUSTRIAL PRODUCTS DIVISION

Dates to Remember

Meetings

APRIL

INTERNATIONAL ACETYLENE ASSN. —Apr. 7-9, Palmer House, Chicago. Association headquarters are at 30 E. 42nd St., New York.

AMERICAN HARDWARE MANUFACTURERS ASSN. — Southern hardware convention, Apr. 11-14, New Orleans. Association headquarters are at 342 Madison Ave., New York.

THE MATERIAL HANDLING INSTITUTE—Spring meeting, Apr. 13, Drake Hotel, Chicago. Institute headquarters are at Clark Bldg., Pittsburgh.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION—National engineering conference, Apr. 13-14, Schroeder Hotel, Milwaukee. Institute headquarters are at 101 Park Ave., New York.

EXPOSITIONS

AMERICAN SOCIETY FOR METALS—Apr. 22-24, Hotel Seneca, Rochester, New York. Society headquarters are at 7301 Euclid Ave., Cleveland.

METAL POWDER ASSN.—Annual meeting, Apr. 26-28, Drake Hotel, Chicago. Association headquarters are at 420 Lexington Ave., New York.

AMERICAN SOCIETY OF TOOL ENGINEERS — Annual meeting & biennial Industrial Exposition, Apr. 26-30, Philadelphia. Society headquarters are at 10700 Puritan Ave., Detroit.

AMERICAN FOUNDRYMEN'S SOCIETY —Annual Foundry Congress & Show, May 8-14, Public Auditorium, Cleveland. Society headquarters are at 616 S. Michigan Ave., Chicago.

SHIPBUILDERS COUNCIL OF AMERICA—Annual meeting, Apr. 14. Headquarters are at 21 West St., New York.

NATIONAL PETROLEUM ASSN.—Semi-annual meeting, Apr. 14-16, Cleveland. Association headquarters are at Munsey Bldg., Washington.

AMERICAN ZINC INSTITUTE, INC. — Annual meeting, Apr. 20-21, Statler Hotel, St. Louis. Institute headquarters are at 60 E. 42nd St., New York.

CASTER & FLOOR TRUCK MANUFACTURERS ASSN.—Spring meeting, Apr. 20-22. Association headquarters are at 27 E. Monroe St., Chicago.

AMERICAN GAS ASSN. — Distribution, motor vehicles and corrosion conference, Apr. 20-23, Mount Royal Hotel, Montreal. Association headquarters are at 420 Lexington Ave., New York.

NATIONAL SCREW MACHINE PRODUCTS ASSN.—Industry national meeting, Apr. 21-23, Statler Hotel, Detroit. Association headquarters are at 2860 E. 130th St., Cleveland.

LEAD INDUSTRIES ASSN. — Annual meeting, Apr. 22-23, Drake Hotel, Chicago. Association headquarters are at 420 Lexington Ave., New York.

FARM EQUIPMENT INSTITUTE — Spring meeting, Apr. 23-24, Biltmore Hotel, Atlanta, Ga. Institute headquarters are at 608 S. Dearborn St., Chicago.

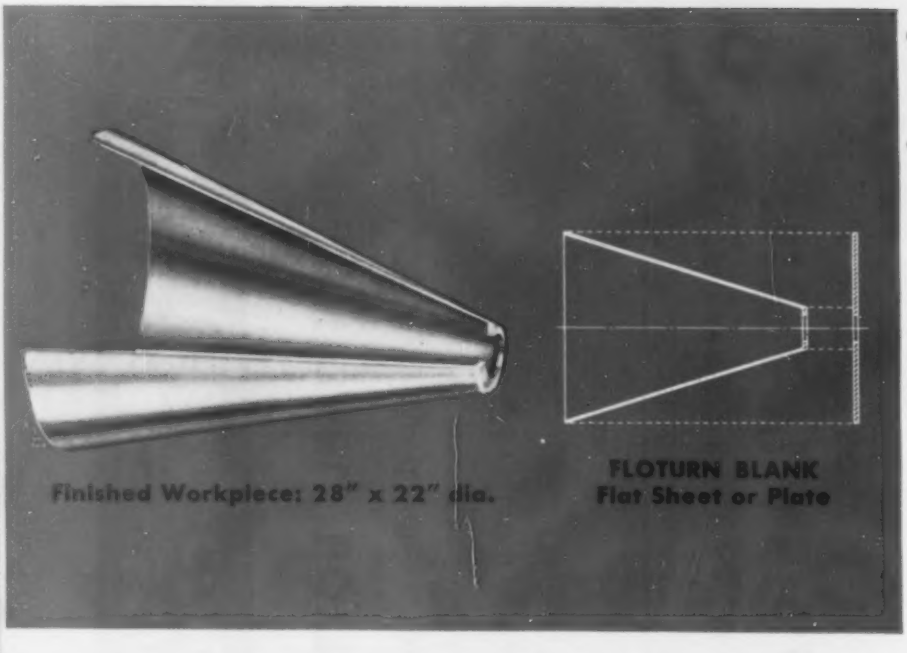
AMERICAN MANAGEMENT ASSN. — Manufacturing Conference, Apr. 26-28, Statler Hotel, Cleveland. Association headquarters are at 330 W. 42nd St., New York.

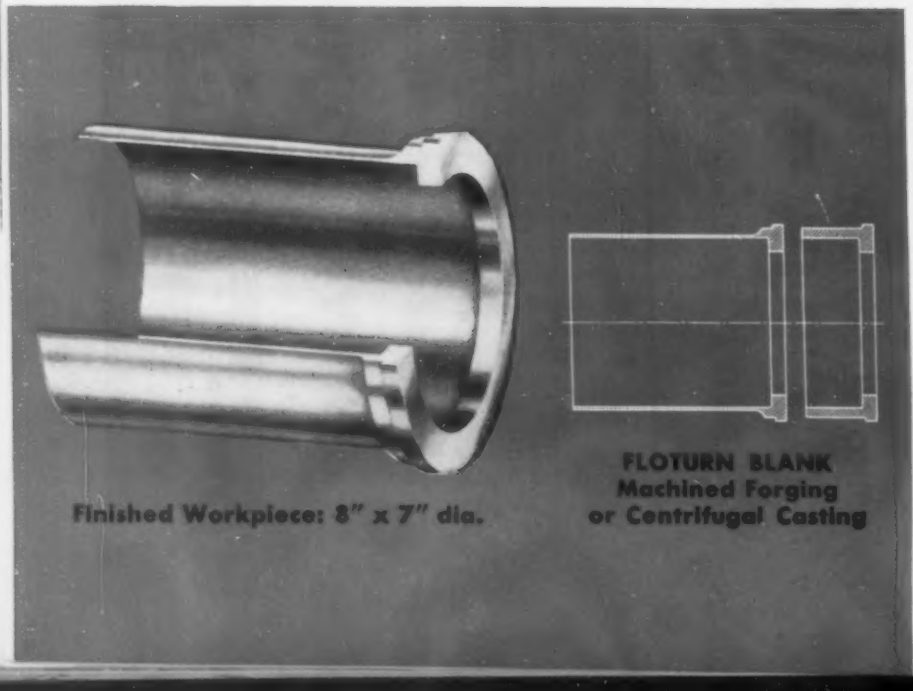
ASSN. OF CONSULTING CHEMISTS & CHEMICAL ENGINEERS, INC.—Apr. 27, Belmont Plaza Hotel, New York. Association headquarters are at 50 E. 41st St., New York.

GRINDING WHEEL INSTITUTE — Spring meeting, Apr. 28-May 1, The Homestead, Hot Springs, Va. Institute headquarters are at 2130 Keith Bldg., Cleveland.

Lodge & Shipley Machine Tools

FLOTU





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...DISPLACES METAL BY COLD FLOWING.

FLOTURN is a completely new process originated by Lodge & Shipley. FLOTURN offers startling advantages and economies in precision metal forming at production rates with low-cost tooling. If you are now producing conical or cylindrical parts by conventional drawing, welding, or machining methods FLOTURN may offer you amazing savings in time, materials and tooling! FLOTURN equipment or subcontract service is available only through Lodge & Shipley and its distributors.

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the Iron Age
FOUNDED 1855

THE IRON AGE Newsfront

FREIGHT ABSORPTION COST ONE STEEL COMPANY over $700,000 in last quarter of 1953. Average per ton shipped was 72 cents. Based on industry shipments during quarter this would approximate $13 million.

ENCOURAGING SALES IN THE LAST DAYS OF MARCH have given automakers new optimism. Indications of the long awaited spring sales surge prompted some manufacturers to cancel cutbacks ordered for April.

TACONITE DEVELOPERS WITH OVER $500 MILLION COMMITTED for processing low grade ore aren't worried about their investment. Despite mild pessimism in the ore industry this year, many steel-backed mining companies continue to believe annual consumption of beneficiated ores will reach 40 million tons within 20 years.

AN ELECTRONIC SHUTTER IN A FREE-RUNNING CAMERA gives versatility to a Navy-built experimental model of a TV recording system. This device replaces the mechanical shutter to synchronize blanking and unblanking of the cathode ray tube with the camera.

EARLY INTRODUCTIONS OF 1955 CARS are definitely in the wind. Scheduling of auto shows, which must be based on knowledge of introduction dates, has been advanced at least two months from 1954 dates.

TRAILER-BORNE LIGHTING EQUIPMENT SETS in three new designs will provide better illumination for field headquarters Army units. Components of the 1½, 3, and 5kw sets are interchangeable. Largest set can be assembled in 75 min, disassembled in 65 minutes.

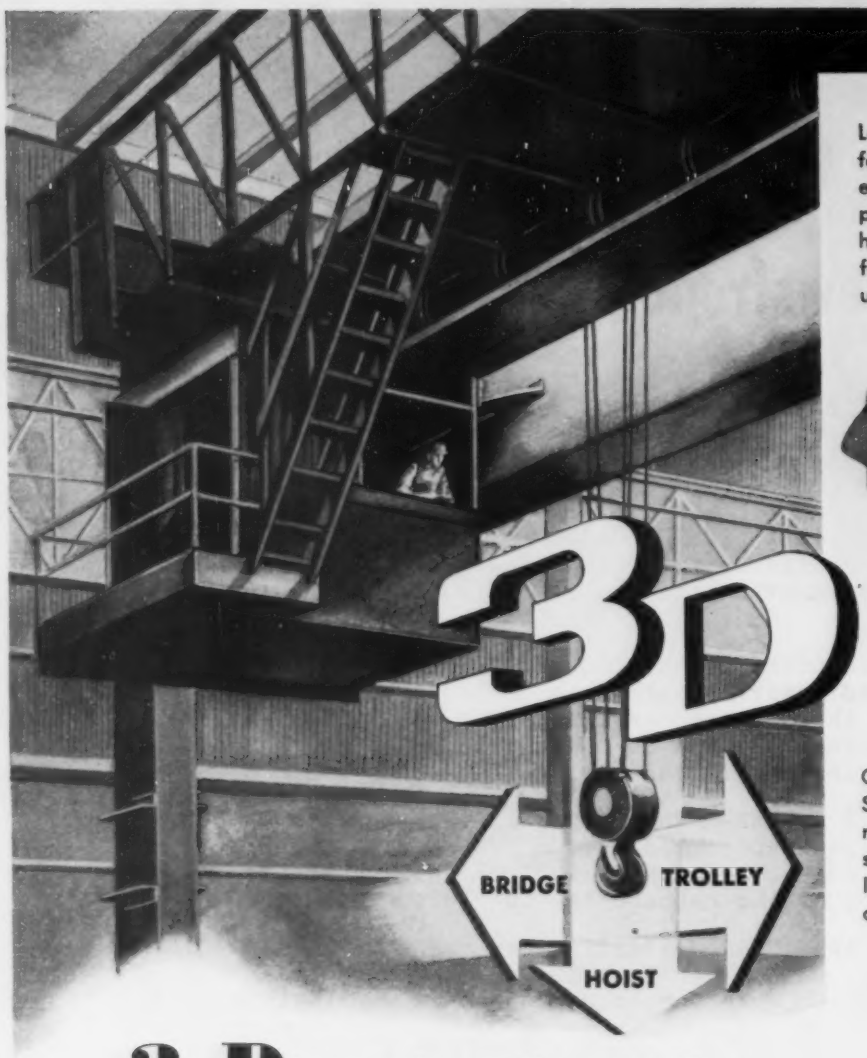
MECHANIZED PLANT MANAGEMENT is now within reach. Computers are available and mathematical expression of management problems is under intense study. Major problem is getting up-to-the-minute information to the computer from scattered production, sales and inventory points. One system is expected to go into operation in 1956.

CORRELATION OF ULTRASONIC AND RADIOGRAPHIC inspection methods to predetermine soundness of 15-in. thick nonferrous ingots has had excellent results, one company report indicates. A 24-million volt Betatron is used in testing the ingots.

LONG, TOUGH BORING JOBS, such as gun barrels, will be done in a fraction of present time with a giant trepanning lathe now being built. An 8000-gal tank under the machine supplies 90 gals of cutting fluid per minute to the trepanning head.

CURVED SWING SPOUTS FOR MODERN KITCHEN SINKS are being made from brass tubing, expanded to special shapes by internal hydraulic pressure. Smooth, close-fitting steel dies determine final contour. Process is economical and tubing stands 2000 psi water pressure.

BOOSTER CYLINDER BUSINESS CONTINUES TO PUSH forward. One office reports sales are beating last year by better than 100 pct, with paper, printing and converting industries offering a good potential market.



3-Direction Control for Cranes is Our Specialty

For more than half a century, EC&M has led in the development of sturdy, highly efficient electrical equipment for cranes.

Designed into this equipment is that extra margin of safety and quality which insures uninterrupted service to the user . . . which also includes features helpful to maintenance men and operators, aiding them in their daily tasks.

Users recognize the symbol, (EC&M) as a standard of value and specify this equipment whenever new cranes are purchased or when revamping existing installations. These users know that control, only a small part of the initial cost, is a vital part of every crane.

It pays to standardize on EC&M Control for cranes.

WRITE TODAY FOR BOOKLET 921

FOR A COMPLETE LINE OF CRANE CONTROL SPECIFY EC&M

THE ELECTRIC CONTROLLER & MFG. CO.

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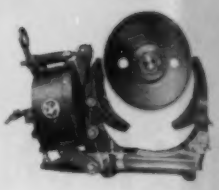
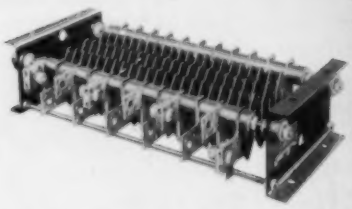


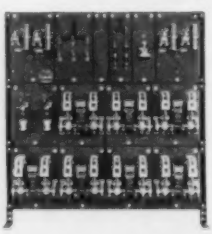
Long-Life Brakes for cranes operated by a-c or d-c power . . . give high speed performance with low upkeep.

Youngstown Safety Limit Stops protect against overhoisting accidents . . . a positive check against human errors.

Cam-Type Master Switches have narrow width and short throw . . . less fatigue for the operator.



Tab-Weld Plate Resistors feature spot-welding that provides a continuous path and keeps resistance value constant.



Reversing - Plugging Control for bridge and trolley motions . . . automatically controlled acceleration and only one adjustable relay for plugging.

Manual - Magnetic Disconnect Switches operate with ease . . . are arranged to control crane lights also.

The Iron Age

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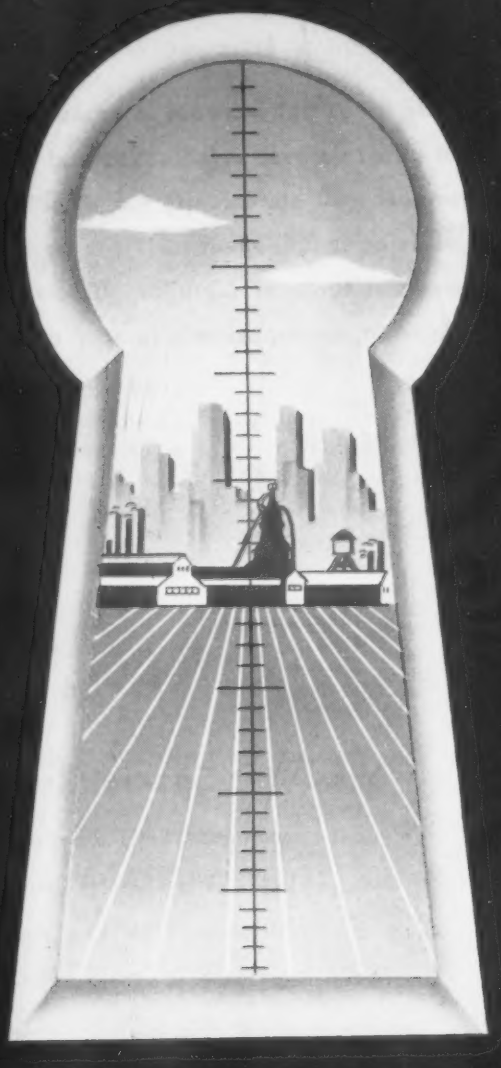
Special Report

Metalworking's Future Markets



Business Outlook

Population Trends

Help on Distribution

Copper, Brass

Magnesium

Aluminum

Titanium

Steel

What the Future Holds for Business

By Arno H. Johnson
Vice-President and Director of Research
J. Walter Thompson Co.
New York

Only a 1½ pct increase in consumer buying in 1954 is needed to offset defense cuts . . . Instead of widely predicted depression, there's opportunity for 10 pct increase in U. S. standard of living in '54-'55—and it can be a third higher by 1960 . . . Demand for over 6 million passenger cars a year is seen . . . Housing, roads, schools to spur metalworking.

A HIGHER standard of living is basic to the industrial growth of the United States. There are internal growth pressures in our economy that point to an immediate opportunity for substantial improvements in these living standards—improvements that can mean expanding markets for the metalworking industry in the immediate future.

We do not need to have any sustained downswing in our economy just because defense needs are less or because inflation pressures have abated—these are favorable rather than unfavorable factors and can lead to new levels of prosperity for almost everyone.

Why This Special Report?

When it became apparent, about a year ago, that 1954 would see the beginning of a tough competitive era, The Iron Age editors began to plan how best they could help readers prepare for this period. It was clear that production would not be the problem it was in the immediate postwar years, that distribution would trade places with it. And so this special study of metalworking's future markets: To help you plan with expert advice on markets, people, products.

ECONOMIST Arno Johnson has authored many outstanding articles on marketing. He's been with J. Walter Thompson Co. for 28 years, has been cited by the Hall of Fame in Distribution.

Much of the pessimism for 1954 is predicted on expected cut-backs in Federal cash expenditures for defense. It is not generally realized that it would take an increase of only 1½ pct in the consumer standard of living to offset this decline in 1954. Federal cash outlays in 1953 were $76.5 billion and for 1954 are expected to be about $73.0 billion—a drop of $3.5 billion. Consumer purchases, at the present level of $230 billion, would need to increase only 1½ pct to offset this much of a drop. Just a 5 pct increase in living standards could offset more than a $10 billion cut in defense expenditures — a far deeper cut than is now contemplated. Furthermore, the President's message on January 28, 1954 indicated that "more than 5 billion dollars of tax savings are now being left with the American people to increase their purchasing power this year."

But there is immediate opportunity for far greater increase in consumer demand than the amount needed to offset defense cuts.

Standard of living can rise 10 pct in '54-'55

Instead of the widely predicted depression my analysis of our present productive ability and consumer purchasing power points to just the opposite—to an immediate opportunity for a *10 pct increase* in sales of consumer goods and services and thus in our standard of living in 1954-55. And this 10 pct increase in consumer demand for goods and services could have a truly *magical* effect on government finances and lowered tax rates; on our ability to provide a strong defense; and on industrial markets through stimulating needs for further improvement in the nation's productive facilities.

Beyond the immediate opportunity for a 10 pct increase in 1954-55, we have the broader real opportunity for *a third higher standard of living by 1960.*

Turn Page

TABLE I

PRODUCTION AND CONSUMPTION
Opportunity for 1/3 Higher Standard of Living

(Billions—In 1953 Prices)

	Prewar 1940	War Peak 1944	Post-war Low 1947	Defense 1953	Expanding Economy Opportunity 1960
Gross National Product	$205.7	$329.3	$282.8	$367.2	$425.0
Defense	4.9	146.2	16.2	51.8	45.0
Other Government Expense	26.7	14.6	20.7	33.1	30.0
Private Investment	32.0	7.1	49.8	52.5	50.0
Personal Consumption	142.1	161.4	196.0	229.8	300.0
Durable Goods	16.1	9.7	25.8	30.1	40.0
Non-Durable Goods	80.5	96.6	107.5	121.2	160.0
Services	45.6	55.1	62.7	78.4	100.0
Population (Millions)	132.1	138.4	144.1	159.7	179.0
G.N.P. Per Capita	$1,560	$2,380	$1,960	$2,300	$2,380

TREMENDOUS increase in Gross National Product (productivity) per capita since 1940 is shown in table at left. Note estimate that personal consumption figure by 1960 can be a third larger than it was in peak year of 1953, that some $10 billion more can be available for durable goods. This assumes a reduction of nearly $7 billion in defense spending by that time. Figures are in terms of constant 1953 dollars.

Continued

In terms of constant 1953 dollars, our per capita productivity increased from $1,560 in 1940 to $2,380 in 1944 (Real Gross National Product divided by population). A similar per capita productivity for our 179 million population in 1960 could mean a Gross National Product of $425 billion by 1960 in terms of 1953 dollars, and could provide the purchasing power for a standard of living approximately *one-third higher* than the peak level of 1953. (See Table I.)

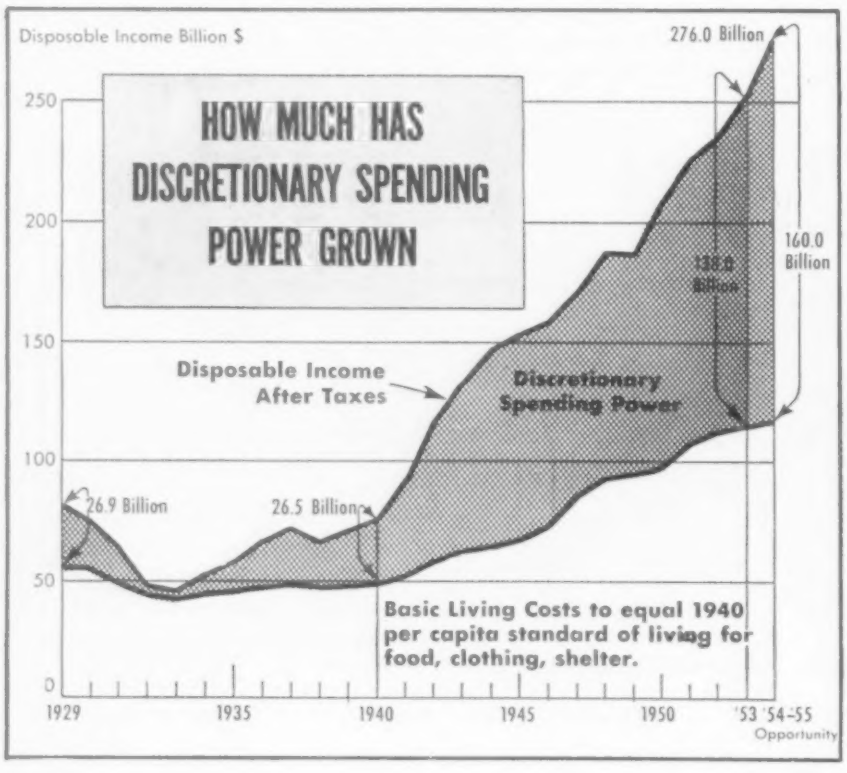
The level of productivity necessary to provide for a continued strong defense and an increase of *one-third in the standard of living* by 1960 should be considered a minimum opportunity because it would require only reaching the production level actually reached per capita in 1944 when our tools of production were far less adequate. An increase of only 2 pct per year in production over the levels reached in 1953 will mean a production of over $425 billion annually by 1960.

Some will ask: "Can we consume one-third more?" Purchasing power is created by production. Our increased productivity already has made possible an advance of 62 pct since 1940 in our total *real* standard of living—even after adjustment for inflation, higher taxes, and heavy defense needs, and in spite of many crippling restrictions on production and incentive.

Further utilization of our productive ability per capital can continue to add to our real purchasing power. If we utilize our productive ability only up to the point proved possible in 1944 we can have the purchasing power to give our people a standard of living one-third higher than at present by 1960, and still maintain the strong defense needed by the U. S.

Discretionary spending power is 5 times 1940 level

Discretionary spending power (the amount of consumer income over and above what would be needed to supply the prewar 1940 per capita level of such basic necessities as food, clothing, and shelter) is over five times as great as in 1940 and represents 55 pct of all disposable income after taxes compared with 35 pct prewar. This can be a powerful influence in expanding consumer demand and expanding the need for new and improved productive equipment.



Millions of families have moved upward in income groups. Early in 1953 there were 5½ times as many families (consumer spending units) with incomes over $3,000 as there were in 1941—a total of 31,860,000 compared with 5,703,000.

In spite of increased taxes and increased prices this movement upward has resulted in rapid increases in discretionary purchasing power. Prewar, our economy was typified by the $25 a week family—average weekly earnings for production workers in manufacturing in 1939 were $23.86. The "middle income" family, for example, fell in the $1,000 to $1,500 income group. Now the "middle income" family is in the $3,000 to $5,000 income group. Weekly earnings in manufacturing by 1953 had grown to $71.57 or three times the 1939 level. After taking into account both increased taxes and present costs of maintaining an equivalent 1940 standard of living in the necessities of food, clothing, and shelter, the middle income family now has discretionary spending power over four times as great as the prewar

middle income family group did.

The net of these changes in income and basic living costs has been a five fold growth from $26.5 billion in 1940 to $138.0 billion at the end of 1953 in discretionary spending power in the hands of consumers. By the end of 1955 this figure may hit 160 billion.

Plant, equipment needs tied to consumer spending power

In the 8 years since World War II (1946 to 1953 inclusive) about $237 billion have been invested in producers' new plant and equipment (including farm equipment and construction). This 8 year total is more than double the amount invested in the previous 16 years (1930 to 1945, inclusive, total $101 billion).

But this high rate of plant improvement and expansion has not been excessive in relation to the new standard of living needs sparked by the increase in consumer discretionary spending power. With the further expansion in living standards new possible outlays for modernization of existing plant and equipment should be accelerated. A substantial volume of productive facilities has become obsolete in view of the new needs.

The annual level of investment in producers' plant and equipment during the last three years (1951-1953) at $36.4 billion average was 4.3 times the prewar level (3 year average 1939-1941) of $8.5 billion annually. This increase in plant and equipment need was almost exactly parallel to the increase in consumer discretionary spending power which also increased 4.3 times in the same period.

The high level of capital goods investment—new plant and equipment—of the 8 years since the war ($237 billion) in itself means a vastly increased market for maintenance since this represents 2 1/3 times the investment of the entire 16 preceeding years.

To these continuing needs for plant expansion, modernization, and maintenance there should be added the urgent needs for new and improved schools, hospitals, and roads. The Economic Report of the President in January 1954 estimates some of these annual pressing needs as follows over the next decade:

ROADS	$8	billion	annually
SCHOOLS	$6¾	"	"
HOSPITALS	$1½	"	"

This means that the mass of American families, because of our increased productivity, are now in a position to have a standard of living far above the bare subsistance or necessity level—with this new kind of purchasing power they can go well beyond their former basic food and clothing requirements either in increased consumption of these items or in selection of better quality or in consumption of other items making for a changed and higher standard of living.

This new concept of the consumer is important to the metal working industry—it means new markets both directly to the consumer and to industry which must have improved plant and equipment to compete efficiently in a market where consumers have a widened range of choice in expanding their living.

TABLE II

PLANT AND EQUIPMENT NEEDS
How Producers' Needs Follow
Consumer Discretionary Spending Power

SPENDING has been at a high rate for new plant and equipment since the end of World War II. In those 8 years total is double that spent in previous 16 years—including the war. But rate has not been excessive in terms of increased consumer spending power. Not only is U. S. population growing rapidly, its character is changing—demanding more durable goods. Increase in past 3 years has kept pace with rise in consumers' discretionary spending power.

	Producers' Plant and Equipment Investment	Consumer Discretionary Spending Power	Total Consumer Purchases of Goods and Services
	(Billion)	(Billion)	(Billion)
Prewar			
1939	$ 6.5	$ 21.8	$ 67.5
1940	8.4	26.5	72.1
1941	10.6	39.9	82.3
3 Year Average	$ 8.5	$ 29.4	$ 74.0
Present			
1951	$ 35.0	$118.0	$208.1
1952	36.1	124.5	218.1
1953	38.1	136.0	229.9
3 Year Average	$ 36.4	$126.2	$218.7
Increase from prewar average to present	4.3 times (329%)	4.3 times (329%)	3.0 times (197%)

The saturation bugaboo vs. 6 million cars a year

In the consumer durable goods market we have for years been warned of saturation. We were told in 1949 that we had caught up entirely with the "deferred demand" of the war shortages, yet during the last four years (1950-1953) consumers averaged $29.4 billion per year in purchases of durable goods at 1953 prices. This was twice the prewar level of $15.2 billion (4-year average 1938-1941 converted to constant 1953 prices for comparison).

Prize Example

Passenger automobiles have been the prize example of a "saturated" market since the early 20's and now, again, we are "saturated." Yet market analysis will show that with intelligent selling and recognition of real needs there can be an annual market for over six million new cars for a great many years to come.

In 1953 only 60 pct of the 54 million consumer spending units owned an automobile. That means there are about 22 million without a car. Income alone is not the retarding factor since even at such low income levels as the $1,000 to $2,000 group some 36 pct manage to own a car. (See Chart.) If only 5 pct a year of these 22 million non-owning families were sold a car this would mean a net addition of over one million cars a year. This is a formidable challenge to both automakers and dealers.

The number of consumer spending units is growing at the rate of approximately one million per year. Even at the present average of 60 pct ownership this represents a net addition of over 600,000 cars per year.

The replacement market (scrapped cars) should represent 3½ million cars per year. Some 27 pct of passenger cars in use are over 13 years old. But the most important market, where a real need exists, has remained almost untapped. This is the need for a second car in millions of homes as the result of changed living conditions.

10 Million Are Frustrated

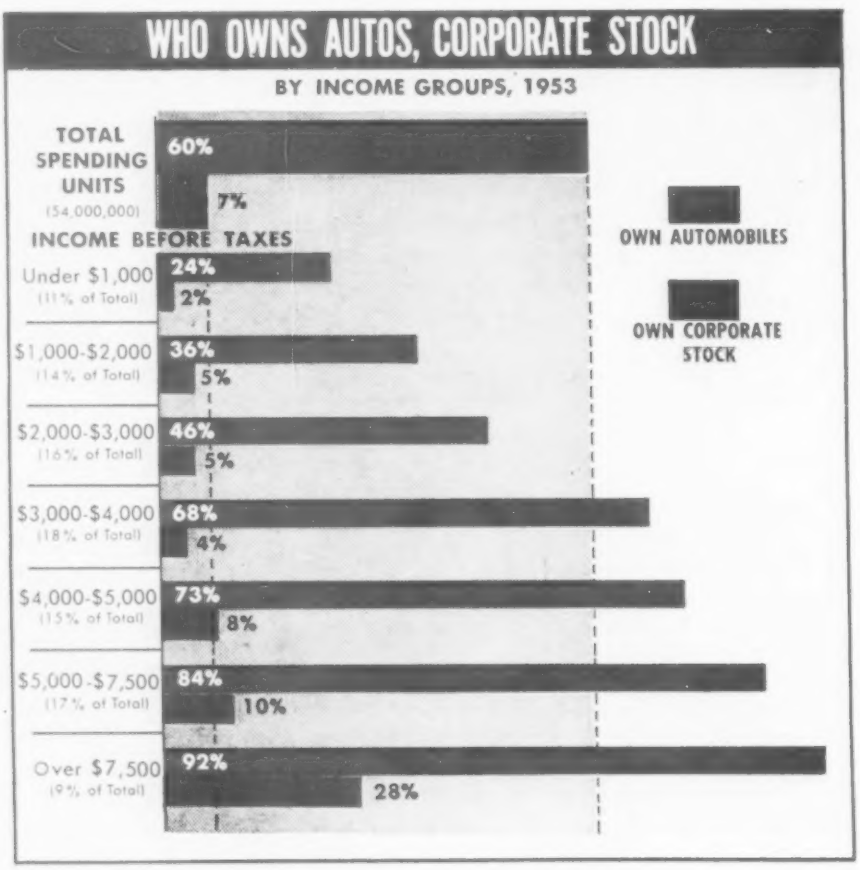
Of the 30 million single car families in the United States 16 million drive the family car to work regularly every working day and park it away from home all day so that it is unavailable to any other member of the family. In over 10 million of these homes another qualified driver is left home without a car. This means that in at least 10 million homes of regularly employed workers there is real need for a second car. This need is becoming more urgent with the trend toward suburban living, shopping centers, larger families, higher education level, higher income, and toward leisure time for the housewife as a result of home appliances. Intelligent and aggressive selling should be able to convert at least 10 pct of these prospects into customers annually—another annual market for over one million additional cars.

Boost Other Products

Thus the annual minimum potential new car market totals over six million cars as follows:

3.5	million	replacement
1.0	"	additional from non-owners
0.6	"	additional from new family formations
1.0	"	additional from new two-car families
6.1		total

And the realization of this added growth in number of passenger cars will continue to expand the market for gasoline and oil, for maintenance and repairs and will put added pressure for road improvements and home improvements.



How housing needs will influence metalworking

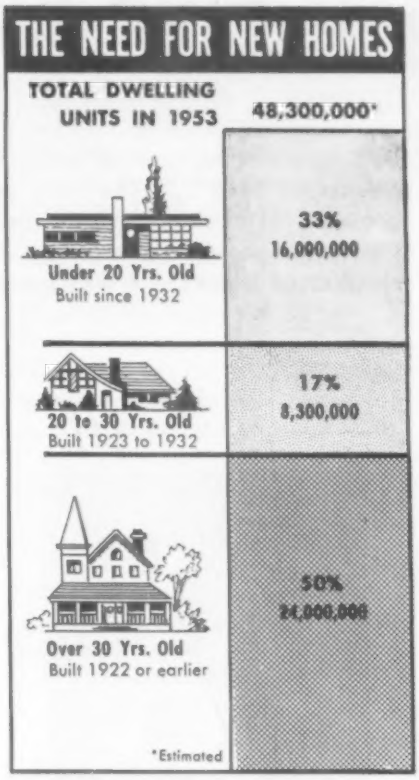
Sixty-seven pct of our dwellings are over 20 years old and half are over 30 years old. (See Chart.)

The majority of our 48 million dwellings were built when families had incomes that hardly covered the bare necessities of living, when only 7 pct of our adults were high school graduates, when there were less than a quarter as many passenger cars and few home comforts or conveniences. Tastes, incomes, education, and modern needs have so changed that a pressure of obsolescence can be far more important to new housing needs than the pressure of additional population.

Major Changes Since '40

Major changes in purchasing power, education, and ownership of automobiles and appliances have taken place in the last 13 years since 1940. These rapid changes super-imposed on housing conditions of a past generation are creating hidden pressures. While new construction in the last few years has been providing approximately one million new homes annually, this has just barely taken care of the growth in the number of families. There is a huge and really unmeasurable opportunity beyond the providing of new homes for new families and that is in the replacing or remodeling of obsolete homes to bring the whole housing standards more in line with the present modern levels of living and education, and in line with the changed distribution of families by income groups.

With 56 million motor vehicles on the road in 1954, or 75 pct more than the 32 million in 1940, the pressure for action to relieve congestion will become intense. Proper rebuilding of our roads, parking facilities, and city streets to accommodate this substantial increase in motor vehicles obviously offers a broad need for new construction. Most of our homes were not built for a motor age—few, for example, have two-car garages.



NEED for new housing can be an important business stimulant.

Population factors are pushing for expansion

By 1960, U. S. population will be some 20 pct larger than it was in 1950. (See the following article on population growth and trends.) But changes in productivity and income, and changes in the character of the population can bring about far greater changes in the standard of living and hence in markets for goods and services.

Larger Durables Market

Changes in the age makeup of the population, in the educational level, in farm population, all add up to tremendous new markets. The impact will be felt in demands for new schools. By 1960 there will be a much larger durable goods market. The farm trend is toward more mechanization. The population shift to the suburbs increases pressure for suburban shopping centers and for multiple car ownership in these areas.

The amazing increase in farm productivity along with a shift of much of the marginal production or low income farm population to industrial areas has resulted in major shifts upward in the standard of living and purchasing power of the remaining farm families. About eight times as many farms now have electricity as prewar, for example, and there are many other signs of increased prosperity on the farms.

These facts on present purchasing power and on the hidden pressures for further sound expansion of our economy could be supported in great detail. They present both a major opportunity and a major challenge to management. The task is that of educating the American people to accept and work for the higher standard of living their productive ability warrants. As the standard of living advances along with productivity the new or expanded markets thus created will have a magical influence on industrial growth and progress, on private financing, and on government revenues.

Era of Opportunity

In view of these pressures for an expanding standard of living during the next decade, the metalworking industries face an era of increasing opportunity that may tax or strain their present facilities and call for revision upward in future growth plans.

New Customers: Five Every Minute

U. S. population, now at some 161½ million, may top 177 million by 1960 . . . The very young and the very old are growing faster than the labor force . . . School enrollment is soaring, high schools must be 27 pct larger by 1960 . . . Number of households was increasing, may now taper off.

By R. W. Burgess
Director, Bureau of the Census
U. S. Dept. of Commerce

DIRECTOR of the Census Bureau, Dr. Burgess is nationally known business and economic statistician. For 25 years he was a statistician and economist for Western Electric.

PROVISIONAL estimates of state populations for July 1, 1953, indicate that the geographic patterns of population change for the first three years of the present decade appear to be a continuation of those for the last decade. (See map p. M-12, and Table I.) West continues to lead in population gains, according to the Census Bureau's latest estimates.

Whether or not the growth of cities and their suburbs today still exceeds the growth for other areas in the country is still uncertain. Between 1940 and 1950, however, four-fifths of the total U. S. population gain of 19 million occurred in the 168 standard metropolitan areas of the country, and nearly half occurred outside their central cities. This reflected the large suburban growth. This process of suburbanization may be continuing within a great many of the standard metropolitan areas but there are no new and comprehensive Census statistics at hand to prove this. Recent special censuses conducted for the city of Los Angeles and a large number of its suburban cities in Los Angeles and Orange counties indicate that, although Los Angeles itself is continuing to grow rapidly, most of its satellite cities are growing even more rapidly.

The acceleration of population growth since the war brought the total population (including armed

TABLE I

HOW U.S. POPULATION HAS GROWN

Regions and Divisions	1940	1950	1940-1950 Increase (Pct)	1953	1940-1953 Increase (Pct)	1950-1953 Increase (Pct)
United States	131,669,275	150,697,361	14.5	158,375,000	20.3	5.1
Northeast	35,976,777	39,477,986	9.7	40,818,000	13.5	3.4
New England	8,437,290	9,314,453	10.4	9,695,000	14.9	4.1
Middle Atlantic	27,539,487	30,163,533	9.5	31,123,000	13.0	3.2
North Central	40,143,332	44,460,762	10.8	46,459,000	15.7	4.5
East North Central	26,626,342	30,399,368	14.2	32,157,000	20.8	5.8
West North Central	13,516,990	14,061,394	4.0	14,302,000	5.8	1.7
South	41,665,901	47,197,088	13.3	49,262,000	18.2	4.4
South Atlantic	17,823,151	21,182,335	18.8	22,534,000	26.4	6.4
East South Central	10,778,225	11,477,181	6.5	11,449,000	6.2	−0.2
West South Central	13,064,525	14,537,572	11.3	15,279,000	16.9	5.1
West	13,883,265	19,561,525	40.9	21,836,000	57.3	11.6
Mountain	4,150,003	5,074,998	22.3	5,600,000	34.9	10.3
Pacific	9,733,262	14,486,527	48.8	16,236,000	67.8	12.1

'50-'53 pattern resembles '40-'50, on geographic basis

Up over 21,000,000 since the end of World War II!

West leads in population gain.

(Figures for 1940 and 1950 are as of April 1 of Census year; figures for 1953 are estimates as of July 1. Armed forces overseas are excluded for all years.)

forces overseas) to 161 million by the first of this year. The great and sustained rise in the number of births, was the principal factor, although declines in the death rate and increased immigration also contributed.

The interplay of the components of population change—births, deaths, immigration, and emigration—have also changed the age and sex structure of the population. Over the long run, the population has been aging. The average (median) age rose from 23 in 1900 to 30 in 1950, for example. The recent "baby boom" has checked this rise of the average age, at least temporarily; and it has remained about the same since 1950. Between now and 1960, the median age of the population is not expected to change much.

Fewer Young Workers

The two extreme age groups, children under 5 and old folks 65 and over, have been the most rapidly growing sectors of the population. Young children increased their proportion in the total population from 8.0 to 10.9 pct between 1940 and 1953, while the elderly were increasing theirs from 6.8 to 8.4 pct. Meanwhile, the proportion of those in the most active working ages, 20 to 44 years, dropped from 38.9 to 36.2 pct; and persons in the later working ages (45 to 64 years) just about maintained their share. All of these broad age groups were increasing in absolute numbers. See Tables II and III.

It is noteworthy that the population of working age, even though growing has lagged behind the total population. Between 1940 and 1953, the total population increased its numbers by 21 pct. Persons 14 years old and over increased by 15 pct, persons 18 to 64 years old by 14 pct, and persons 25 to 44 years old by 17 pct.

The average annual number of young people attaining age 14 was less in the late 1940's (wartime). In the past three years, however, the annual accretion to the population of working age has gone up again to 2.2 million, and between now and 1960 it will rise to 2.6 million.

Since labor force participation is quite low at age 14, a better beginning age is 18 when, for the first time, more than half of boys are in the labor force. The numbers arriving at this more significant age lag behind the numbers based on 14 years of age, of course, and are not affected by the upturn in births until four years later. The annual average since 1950 of 2.1 million represents the trough of this variation as compared with about 2.3 million annually for '45-'50, '53-60.

The number of persons attain-

Today . . .

Today, in the early spring of 1954, the population of the United States exceeds an estimated 161½ million. This figure represents an increase of more than 10 million since the 1950 Census and of nearly 30 million since the 1940 Census. For those who use the end of the shooting in World War II as a point of reference, it may be noted that the population increase during the eight and one-half years that have elapsed since then has amounted to about 21½ million. Last year, the population of the country increased by an estimated 2.7 million.

. . . and Tomorrow

Under various assumptions as to births, deaths and net immigration, the population projections for 1960, range between about 174 million and 177½ million. For 1970 they range between 189 million and 204 million, while the projections for 1975 range between about 198½ million and about 221 million. Uncertainty about the future course of births accounts for the spread. All of these projections are based on the assumption that there will be no disastrous wars, major economic depressions, epidemics, or natural catastrophes.

TABLE II

POPULATION BY AGE GROUPS

Civilian Population, July 1, 1952

These are the fastest growing groups

More young and old folks increases load on these people... the labor force

Regions and Divisions	Total Civilian Population	Under 5	5 to 17	18 to 64	65 and Over
United States	153,324,000	17,144,000	33,112,000	89,967,000	13,101,000
Northeast	39,927,000	3,939,000	7,682,000	24,610,000	3,696,000
New England	9,357,000	943,000	1,851,000	5,607,000	955,000
Middle Atlantic	30,570,000	2,996,000	5,830,000	19,003,000	2,741,000
North Central	45,523,000	5,074,000	9,468,000	26,752,000	4,229,000
East North Central	31,433,000	3,504,000	6,453,000	18,688,000	2,788,000
West North Central	14,090,000	1,570,000	3,015,000	8,065,000	1,441,000
South	47,462,000	5,738,000	11,690,000	26,582,000	3,453,000
South Atlantic	21,499,000	2,589,000	5,224,000	12,185,000	1,502,000
East South Central	11,294,000	1,365,000	2,930,000	6,148,000	850,000
West South Central	14,670,000	1,784,000	3,536,000	8,249,000	1,101,000
West	20,411,000	2,393,000	4,272,000	12,023,000	1,723,000
Mountain	5,330,000	699,000	1,289,000	2,951,000	391,000
Pacific	15,081,000	1,694,000	2,983,000	9,072,000	1,332,000

(Each estimate has been independently rounded to the nearest thousand from figures computed to the last digit; hence, the sums of parts shown may differ slightly from the totals shown.)

By 1960 labor force may be 72 million, school enrollment breaking records . . . Slight increase in women workers . . .

ing age 65, on the other hand, has shown a steady increase. The number reaching this age now exceeds one million a year and will average 1.2 million a year between now and 1960. Although over half of men now stay in the labor force for several years after 65, the long-run trend has been toward earlier retirement. Ages 18 to 64 roughly define the most important period of full-time labor-force activity.

The net effect of the above changes is that for persons 18 to 64 the number increased by an average of about a million a year during the 1940's. Since 1950 their annual increase has dropped off to 650,000. There will be very little upturn in the period 1953-1955; but, in the next five years, there should be a partial recovery to 775,000.

The average annual increases for all working ages (14 and over) are: 1940-50 and 1950-53, 1,200,000; 1953-55, 1,100,000; and 1955-60, 1,500,000. The large annual increase for the latter half of this decade reflects the arrival at age 14 of children born during the war.

14 to 17 Pct Growth

From another angle, it may be seen that the population 14 and over will increase 11.7 pct during this decade, about the same as last decade's increase of 11.5 pct. For the more important working ages of 18 to 64, however, there will be a drop—from 11.7 down to 7.8 pct. Finally, for the prime working ages, 25 to 44, decennial growth will drop from 14.3 down to only 2.4 pct. Thus labor force growth will receive less support from population growth in the 1950's than it did during the 1940's.

During the 1950's the growth of the total population may amount to 14 to 17 pct depending on the assumption as to future births. (See Table III.) These much larger rates of increases imply a relatively greater increase in the numbers of dependent children and old people and, thus, a growing load on the labor force. Furthermore, the older working ages, 45 to 64 will increase much more rapidly than the prime ages of 25 to 44—the ratio is 19 pct to 2 pct.

More Women

Assuming a prosperous peacetime economy, the Nation's average labor force would be expected to expand to approximately 72 million by 1960, as compared with 64 million in 1950. (The actual number in April, 1953, was 66.3 million.) These figures imply an average annual increment of 800,000 or 1.2 pct, during the present decade. As the large crop of babies from World War II and the early postwar period attains working age, an annual increment of 1.2 million, or 1.6 pct, would be anticipated during the 1960-1970 period.

According to these projections the historic advance in labor force participation among women will

TABLE III

POPULATION OF THE U.S., 1940-1960

Estimates and Projections of Total Population Including Armed Forces Overseas, as of July 1, 1953

(000 Omitted)

Age and Sex	1940	1950	1953	1955	1960
Both Sexes, Total	131,970	151,677	159,689	164,644*	176,126*
Under 14 years	30,534	38,597	43,112	45,875*	49,805*
14 to 17 years	9,831	8,446	8,878	9,239	11,187
18 to 24 years	16,539	16,014	15,321	15,117	16,246
25 to 44 years	39,787	45,495	46,617	46,934	46,598
45 to 64 years	26,258	30,760	32,295	33,508	36,589
65 years and over	9,021	12,364	13,466	13,973	15,701

(Pct Distribution)

Age and Sex	1940	1950	1953	1955*	1960*
Both Sexes, Total	100.0	100.0	100.0	100.0	100.0
Under 14 years	23.1	25.4	27.0	27.9	28.3
14 to 17 years	7.4	5.6	5.6	5.6	6.4
18 to 24 years	12.5	10.6	9.6	9.2	9.2
25 to 44 years	30.1	30.0	29.2	28.5	26.5
45 to 64 years	19.9	20.3	20.2	20.4	20.8
65 years and over	6.8	8.2	8.4	8.5	8.9
14 years and over	76.9	74.6	73.0	72.1	71.7
18 to 64 years	62.6	60.8	59.0	58.0	56.5

* Projections are based on assumption that birth rates will decline somewhat by 1960, but will still be considerably above 1940 levels. Other population estimates published by the Bureau in conjunction with these, but using somewhat different assumptions, are as follows: Under assumption of an indefinite continuation of present birth rates, the estimates for 1955 and 1960 would be 164,782,000 and 177,426,000, respectively. Under assumption of a decline in birth rates by 1960 to roughly the 1940 levels, the corresponding figures would be 164,403,000 and 173,827,000. Under any of these assumptions, the only age group affected would be children under 14 years of age.

...During the 1950's the 45-64 age group will increase faster than the 25-44 group.

Proportion of workers in most active age group (20-44) dropped between 1940 and 1953.

TABLE IV

TOTAL EMPLOYMENT IN MANUFACTURING

1939 and 1947 Data from Census of Manufacturers, 1952 Data Are Estimates Based on Annual Survey of Manufacturers

This region was second (after west) in regional gain on % basis

smallest gain here

South, (with 2nd largest population gain) had 3rd largest gain here

Mfg. employment in West shot up by 137.5%!

Regions and Divisions	(000 Omitted) 1939	1947	1952	Pct Increase 1939-1952 Population	Mfg. Employees
United States	9,527	14,294	15,944	20.3	67.4
Northeast	3,879	5,426	5,766	13.5	48.6
New England	1,121	1,475	1,497	14.9	33.5
Middle Atlantic	2,758	3,954	4,269	13.0	54.8
North Central	3,183	5,103	5,637	15.7	77.0
East North Central	2,693	4,318	4,706	20.8	74.7
West North Central	491	785	931	5.8	89.6
South	1,851	2,706	3,085	18.2	66.7
South Atlantic	1,111	1,523	1,739	26.4	56.5
East South Central	410	633	678	6.2	65.4
West South Central	331	550	668	16.9	101.8
West	613	1,055	1,456	57.3	137.5
Mountain	89	142	175	34.9	96.6
Pacific	523	914	1,282	67.8	145.1

(1939 and 1947 data from Census of Manufactures, 1952 data are estimates based on Annual Survey of Manufactures.)

continue, although at a somewhat decelerated pace, during the present decade. From an estimated 31.3 pct in 1950, the projections indicate an increase in the female labor force participation rate to 33.8 pct 10 years hence.

Fewer Men

On the other hand, some further decline would be anticipated in male labor force participation during the next several years. The rate for men, estimated at 83.3 pct in 1950, would drop slightly to 81.1 pct by 1960. Virtually all of this reduction would be expected to occur among school and college-age youths and among men 65 years old and over. For men between the ages of 25 and 64, the group which has traditionally represented the core of the full-time labor force, the stability in rates observed over the past several decades would continue in the future.

The effect of the accelerated increase in the number of children in the school ages on school enrollment has been profound and will continue to be felt for the remaining years of the present decade. A new record of 33 million persons enrolled in school or college was set at the beginning of the 1953-54 school year, according to the results of a recent sample survey by the Census Bureau. The number enrolled in October, 1953, was about 1.7 million larger than the number enrolled one year earlier and about 3.4 million, or 12 pct larger than in October 1950. Two-thirds of the increase in the number enrolled was in the 5 to 13 year old group.

Of the total of 32.8 million persons 5 to 34 years old who were enrolled in October, 1953, about 23.2 million were in elementary school, 7.3 million in high school, and 2.4 million in college or professional school.

Breakdown on Schools

In response to numerous requests, the Census Bureau has published projections of enrollment in elementary and high schools for the United States as a whole, for 1953 to 1965. According to these projections, enrollment in elementary and high schools is expected to increase by more than 1.3 million annually, a rate of increase of about 4 pct a year, to at least 1959, when this year's crop of babies will be entering school for the first time. It is estimated that about 39 million children will be enrolled by 1959, or one-third more than were enrolled in 1952. For the next several years, the elementary grades will bear the major burden of these increases, although high school enrollments will also be increasing at a substantial rate.

It is estimated that high school enrollment will increase by at least 3 pct annually from the middle of this decade through 1964, with the peak growth rate coming early in the 1960's. During this period the large elementary school classes of the present decade will be advancing into high school. By 1960, the high schools will enroll about 9.4 million students, and, by 1965, 12 million, compared with a current enrollment of about 7 million. Roughly speaking, for every three students now attending high school, there will be four students in attendance by 1960, and five is the estimate that has been made for 1965.

Elementary Enrollment Up

According to these projections, elementary enrollment, which will be increasing rather rapidly for the next several years, will reach a level of about 30 million in 1959, an increase of almost 8 million in seven years. Changes in total elementary enrollment after 1959 cannot be estimated with any great degree of confidence since they will reflect to a great extent changes in the cohort of persons yet to be born. On the basis of reasonable assumptions, it appears that enrollment in elementary grades between 1960 and 1965 will remain, for the most part, somewhere near the 1959 level of roughly around 30 million students.

One of the most important

The "Household" barometer changes . . .
Trend away from farms continues . . .

measures used by those who study market prospects is that of the number of households. The latest Census estimates available are the figures for April, 1953. At that time, the number of households in the United States was estimated to be about 46,828,000. This is a gain of about 950,000 over the corresponding figure, 45,876,000, for April, 1952. During the three years 1950-1953, the average annual increase in number of households was also about 950,000; for the period 1947 to 1950, the annual increase had been far larger, about 1,500,000; and for the period 1940 to 1947, the annual increase had been much smaller, about 600,000.

Under very favorable conditions, the annual increase in number of households might remain about constant at the level of recent years until 1955 and then drop slightly during the years 1955 to 1960.

The "Household" Barometer

If the medium series of projections made by the Census Bureau in 1952 prove most nearly accurate, there will be an average increase in the number of households of about 600,000 to 700,000 per year from 1953 to 1960. According to this series, the number of households will reach a point between 51 million and 52 million in July 1960.

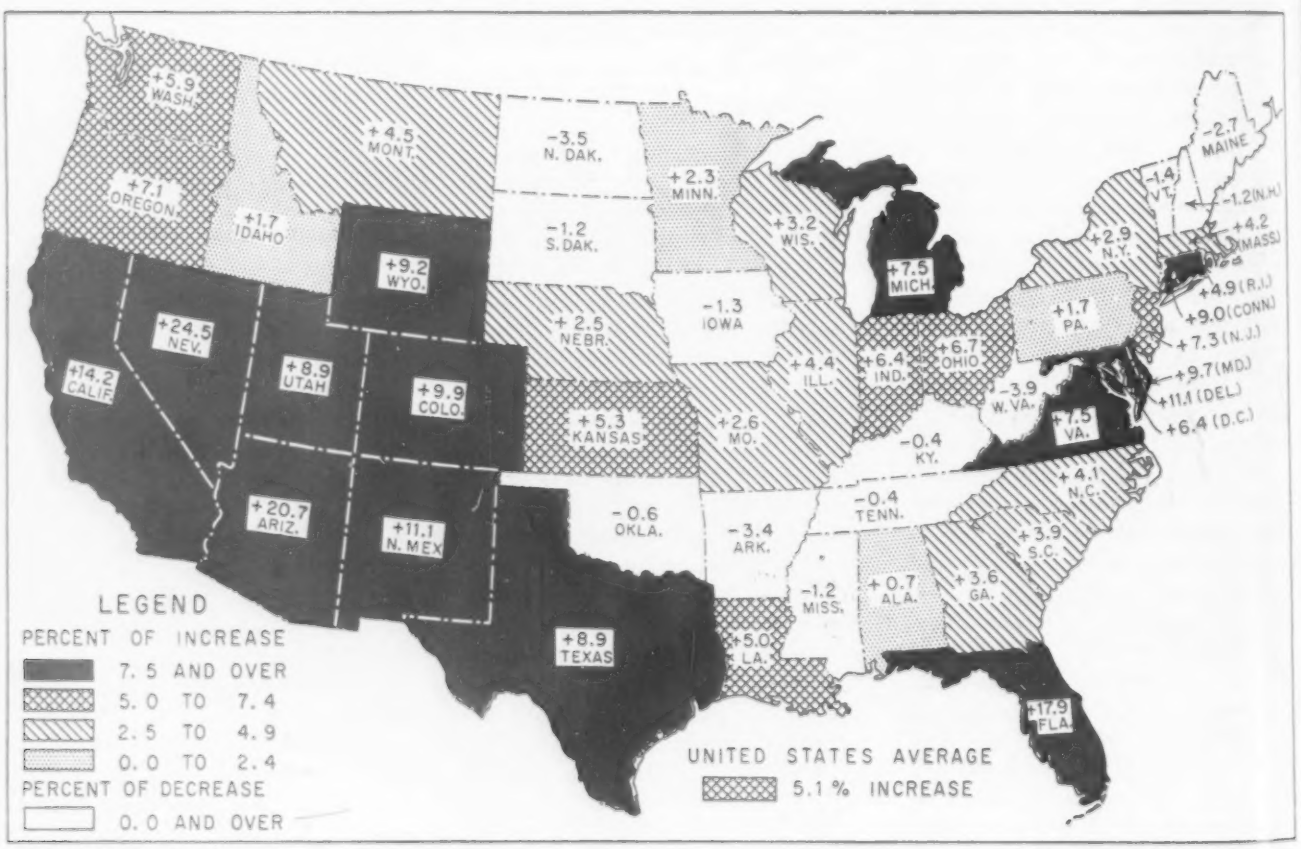
Americans move around a lot and for various reasons, mostly economic. Annually, the Census Bureau includes in its current population surveys an inquiry as to where those interviewed lived a year earlier. The last such survey, in April, 1953, revealed that 31 million persons, one year old or over, were living in a different house from that of the year before. Of those who had changed residence during the year, 21 million still lived in the same county and 10 million lived in a different county.

The 1953 survey revealed a continuation of the general trend of movement away from the farm. While an estimated 1,180,000 persons moved to the farms from nonfarm residences, an estimated 1,686,000 moved away from farm residence to nonfarm residence.

Nine Out of Ten Move

An earlier mobility survey, in April, 1952, revealed that at that time nine out of 10 Americans had moved at least once in their lifetime. About one-fourth of the total had moved during the previous year or so, three-fifths of the total since the end of World War II, while three-fourths of the total had moved since the beginning of that war.

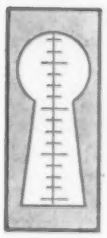
PERCENT OF CHANGE IN TOTAL POPULATION OF STATES: 1950 TO 1953



DEPARTMENT OF COMMERCE — BUREAU OF THE CENSUS

Copper: Many Factors Will Affect its Future

By Kemp G. Fuller
Marketing Consultant
Pittsburgh



Copper, an international metal, has problems quite unlike those of aluminum and steel . . . Politics, foreign and domestic, complicate the issue . . . Yet, including scrap, some 2.9 million tons should be available to the U. S. in 1957, up 21 pct above '53 . . . Wire mill potential is strong.

COPPER, like steel, has grown because of forces generally external to the metal itself. The mine and secondary supply outlook will influence its availability. Political trends can affect its supply. Added to these are technological, commercial and product trends and substitution influences.

This article will report on the chief influences affecting copper, leaving the individual to make his own appraisal of the changing trend.

Copper Is International

Many misunderstandings about copper arise from the belief that there must be strong similarities in its problems—although differing in degree—and those in steel and aluminum. While all three are major metals and use many of the same types of mills, finishing equipment, etc., there the chief similarities end. Unlike steel and aluminum, copper is an international metal with the London Metal Exchange, Continental, Chilean and other prices to consider. Steel and aluminum are integrated industries, generally speaking, with a high degree of single ownership from the ore to the finished mill product, and frequently beyond. Copper is largely a remotely and diversely connected group of five different industries: Miners, refiners, brass mills, wire mills and ingot makers. Steel is a literate, well-educated industry. Copper, as an industry, is extremely intuitive but has a long way to go to reach complete industrial literacy, although certain companies are exceptions.

Will Earn More

Perhaps because of these facts rather than in spite of them and because of other trends which will be outlined later the prime companies in the copper industry, the low-cost, well-managed companies, will, it is predicted, make more money per dollar of sales in the next 20 years than similar companies in either steel or aluminum.

The United States changed with World War II from an exporter of copper, on balance, to an importer. It is highly unlikely although not impossible that the United States will ever again be self-sufficient as to copper. The following rounded out averages, based on Bureau of Mines figures, indicate the sources during the period between World War II and the Korean War.

U. S. COPPER SOURCES	PCT
New copper—domestic ores	40
New copper—foreign ores	20
Secondary copper—old scrap	20
Secondary copper—new scrap	20
	100

From 1951-1953 new copper from domestic ores has varied between 925,000 and 950,000 net tons a year. As new mine projects, chiefly in the West but with 15 pct of the tonnage in Michigan, come into production a net increase of about 250,000 tons of capacity will be available by 1957. This allows for some present production which will by then be extinct.

CONSULTANT, primarily to steel and nonferrous metal companies, Mr. Fuller has served as chairman of the American Iron and Steel Institute committee on commercial research and as a consultant in Washington on military and civilian metal requirements.

New copper from foreign ores climbed on a net import basis to over 500,000 net tons in 1953. An additional 100,000 tons may be available to this country from new foreign mine projects by 1957. So new copper from mines should increase from 1,450,000 in 1953 to 1,800,000 tons in 1957. Secondary copper from old scrap has no basis to increase at the same rate, and, price relationships being equal, it

"The best thing that could happen to the copper industry would be a long period of stable prices . . ."

will probably not be greater, and may be less, in 1957 than 450,000 tons. This is approximately the average since 1944. Secondary copper from new scrap will, because of its usually short re-circulation period, increase proportionately to the combined increase in new-mined copper and secondary copper from old scrap, or say from about 525,000 tons in 1953 to approximately 625,000 tons in 1957.

Rounding out these statistics we reach a figure, including both old and new scrap, of some 2,400,000 net tons of copper for 1953 and 2,900,000 in 1957, an increase of 500,000 tons, or 21 pct. There are no known projects under way to indicate further increases, so this total may be used for the time being as a guide to 1964 U. S. supply.

Politics Affect Supply

Because of this country's lack of copper self-sufficiency and the international character of the metal, political considerations are of greater concern than for either steel or aluminum.

All the political factors shown in the accompanying box can affect the supply of copper, and if the foreign factors change are more likely to diminish U. S. supply than to increase it.

Technological progress has been greater in the winning and refining of primary copper than in its fabrication. The strong demand for copper and higher prices have pushed the cut-off percentage for ore still lower, which has necessitated greater ingenuity in the recovery of both copper and available by-product metals. The same two pressures have stimulated greater exploration, where new developments in geological sciences aided by geophysical and geochemical techniques have helped to do a better job of prospecting. Even more importantly, prospecting has been aided by more liberal budgets for exploration. At the fabricating level the chief developments have occurred in wire mills, along the lines of better insulating materials, chiefly synthetic.

Price Halved on Labor Basis

The price of copper at the beginning of March 1954 was approximately 30¢ per lb, or about one-sixth of the prime hourly labor rate, now about $1.80 an hour. In the 1920's when the similar labor rate was 40¢ an hr, copper then sold for between 13 and 14¢, or one-third of the prime hourly labor rate. Inflation, taxation and currency juggling have made necessary such comparisons, and on the basis of how many minutes a man must work to buy a pound of copper the comparison does not seem unfavorable—twenty minutes in the 1920's, ten minutes in 1954.

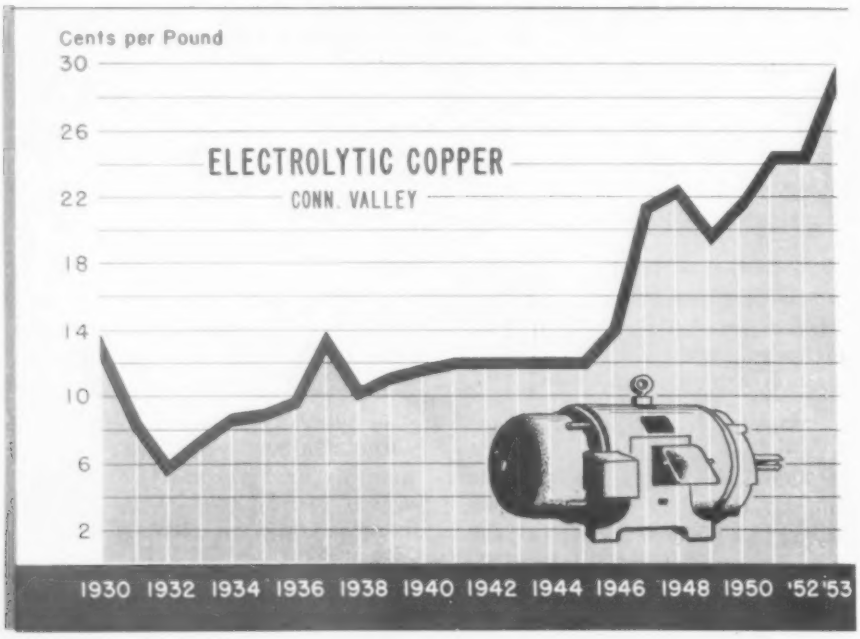
It is a safe assumption that U. S. labor rates will continue to increase. Copper, in spite of much mechanization, has more man hours in it per ton than steel or aluminum. These two trends point to (1) Higher prices for copper in the long term future than were forecast before the Korean War, and (2) a widening spread in price between copper and the other two metals.

Price Fluctuations Hurt

Copper's chief price disadvantage is not wholly its price level but largely its price instability (see chart). On a rising market or in periods of shortage users stock up and then live off their inventories until another change occurs in the market. This makes for sharp fluctuations in output, sends unit production costs up, and makes more difficult the establishment of job stabilization programs. The best thing that could happen to the industry would be a long period of relatively stable prices.

The problem of copper substitution is sometimes confused by the fact that aluminum and plastics have taken certain markets away from it. Aluminum and plastics are growing at an extremely rapid rate, far faster than copper. The erroneous deduction from these two true statements is that copper is vulnerable across the boards to losing most of its markets. The facts are that aluminum and plastics have grown chiefly, although by no means wholly, in markets where copper never was, nor ever could have been a factor. While it is also true that the substitution trend is almost entirely away from copper, the hard core of retained copper applications has an exceedingly bright and prosperous future. While cop-

Copper Price Trends



PRODUCT TRENDS

Brass Mill — With slowdown of the ammunition program, brass mill sheet for cups and discs will also dip. The product with the strongest growth potential now appears to be tube, followed by sheet, wire and rod. Tube has key applications in housing, air conditioning, refrigeration, and in the chemical and petro-chemical fields. It suffers relatively less competition from other materials than sheet, wire or rod.

Wire Mill—Higher voltage underground cable, wires and cables used by the electrical manufacturers and building wire are expected to show the greatest future growth.

per now sells at almost five times the price of aluminum on a volume basis, it is reasonably arguable that no likely reduction in copper prices will recapture significant tonnages from aluminum nor will any commercially probable higher price for copper lose any more business than is already in course of being lost.

The End-Use Mystery

Markets for copper products cannot be accurately reported. While many companies have good end-use information, there are no detailed facts on an industry basis. Government figures give some clues but are not considered authoritative because of the sampling problem and other distortions.

The brass mill industry is considering end-use information, but this is in the exploratory stage. Wire mill data is even more difficult to estimate because of the high proportion of captive wire mills. The opinions of the experts in the wire mill industry are almost too far apart to use for an average.

Ohio Is Use Center

As to geographic distribution of fabricated copper products, the center of gravity for the consumption of all brass mill products is in Ohio; the copper wire mill consumption area is nearby. Areas for both groups of fabricated products showing the greatest rates of growth presently and probably in prospect are: Southeast, Southwest, and Pacific Coast. These are not listed in order of magnitude. Not as high a percentage of copper goes to the West Coast as the approximately 9 pct of steel production of the United States.

Construction No. 1 for Brass

Principal civilian brass mill markets in order of importance are construction, automotive, industrial equipment and electrical. There are good prospects in the housing and remodeling market as well as the others, particularly electrical. Exports are negligible as far as brass mill products are concerned, but imports have caused some loss of business during 1953.

Principal copper wire mill markets are the electrical equipment manufacturers, building wire and the electric utilities. The market picture is complicated by the many captive mills supplying some of the larger electrical and automobile companies. While about 90 pct of wire mill products are for electrical use—and 55 pct of all primary copper—the market trends do not always parallel the enormous growth of the electrical industry. Railroad dieselization is nearing completion and copper uses here are thus tapering off. The telephone industry has been operating at such a high rate that it is not expected to increase its take to any considerable degree in the near future.

Wire mills present extremely strong growth potentials. The vast and relatively stable growth of the electrical industry, doubling as it has each 10 to 12 years, gives them the firmest of foundations. They sell electrical conductors regardless of the color of the metal. Substitution with them is just a question of how much weight they put in one stirrup or the other, and the more than 175 wire mills are completely in the saddle as far as riding the growth trend of the electrical conductor industry is concerned.

With more than half the primary copper going to electrical end-uses, there are still plenty of retained copper uses to make aluminum a welcome partner to share the burden, which, over a period of years, would be insupportable by copper alone.

Political Factors May Affect Copper

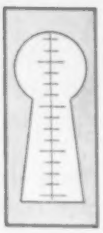
Both Foreign . . .

- Rising tides of political unrest and labor trouble in Africa. Unless mining is purposely held back, Northern Rhodesia may soon permanently exceed Chile, after the U. S., as the world's leading copper producer.
- Problems in Chile, which have long included a huge unsold copper stock, its taxation and exchange laws, inflation and the autonomy of mine management.
- Trends toward nationalization of natural resources in many foreign countries, i.e. Bolivian tin mines.

. . . and Domestic

- Import tax on foreign copper will again become effective July 1, 1954, unless a new bill, which has been introduced, is passed by Congress. With domestic mines cut back there may be opposition to this bill.
- Policy on the unfilled copper stockpile is subject to political decisions.
- Effects of tax laws on exploration and prospecting; policy on tax amortization, and government guaranteed floor prices for certain high-cost mine output.

Steel: What Will Demand, Output Be During 1955-1959?



Steel industry might ship 77 million tons in a good year during the 1955-59 period; would require output of about 108 million ingot tons . . . Fundamental changes in steel use not expected, but shifts in business activity would affect distribution.

By B. E. Estes
Director of Commercial Research
U. S. Steel Corp.

MARKET demand for steel products depends on the level of general business activity, especially the activity of various steel consumers such as the construction, machinery, and automotive industries.

Rather than speculate on future fluctuations in the U. S. economy, it seems more constructive to assume certain levels of national economy and then consider steel demand in the light of these assumptions. This will enable the reader to adjust the conclusions in terms of his own opinion of the business future.

Before attempting to analyze the future, it is helpful to develop a reasonably firm starting point by assembling appropriate data for a past period. Only by starting from the known can an objective approach to the future be made.

What Happened in the Past

The 4-year period 1949-52 has been selected as the base point because the level of steel inventories was about the same at the end of this period as at the beginning.

This was so despite the fact that these 4 years included two periods of substantial steel inventory building, as well as two strike periods in which steel consumption was far in excess of steel shipments from mills. Result was that inventories were rapidly reduced.

For the period as a whole, however, steel consumption approximately equaled total steel shipments.

Ship Nearly 70 Million Tons

This 4-year period included 1949, a year of mild recession; 1950, a year of high business activity. Overall the period was one of high, though not peak, economic activity. Gross National Product averaged $328 billion in terms of 1953 prices, the new Federal Reserve Index of Production was at 113 pct of the 1947-49 average, and unemployment was around 2.5 million, or 4 pct of the civilian labor force.

During this 4-year period of generally good business, net steel inventory building was negligible, ingot production averaged 93.3 million tons per year, and ship-

Watch These Steel Trends:

There will be increased steel demand for:

(1) Containers
(2) Highway and bridge construction, machinery
(3) Office buildings, factories, homes

There will be:

(1) Greater demand for electrolytic tinplate . . . less use of hot-dipped tinplate
(2) More emphasis on wide-flanged beams . . . less on standard structural shapes.

You can expect:

(1) Decreased demand for large diameter linepipe since many of the major natural gas lines have been completed.

ESTIMATING the steel market is Bay Estes' business. Director of commercial research for U. S. Steel Corp., he also coordinates the work of 10 other of the firm's research organizations. Before joining U. S. Steel 15 years ago, Mr. Estes was assistant dean and research assistant at the Harvard Business School and with an investment banking firm.

Inventory buildup by steel mills last year is estimated at 2 million tons of finished products . . . Consumer stocks were upped 3 to 4 million tons

ments of finished steel products to domestic consumers and export markets averaged 69.3 million tons annually.

Built-Up Steel Stocks

In 1953, a year of peak economic activity, however, GNP totaled $367 billion, the FRB Index was at 134, and unemployment, although rising at year end, was less than 2.5 pct of the civilian labor force which totaled 63.0 million.

In this peak year, steel ingot production reached a record total of 111.6 million tons, and finished steel shipments totaled 80.2 million tons.

There is evidence that a portion of the finished steel shipped in 1953 went into building inventories at various points and in various forms between the time it left the steel mill and the time it became part of a completed bridge, building or manufactured products. How much this inventory building amounted to is unknown but it might be estimated at 3-4 million tons.

This means that, compared with the approximately 80 million tons of finished steel shipped, around 76-77 million tons were used by steel consumers, or about 7 million tons more than was consumed annually in the 1949-50 period of generally good, but not peak, business activity.

Steelmakers Kept Some

The declining ratio of finished steel shipments to ingot production in 1953 indicates that steel companies themselves may have accumulated some inventories in the form of cold ingots, semi-finished materials, and finished steel products.

The amount of inventory buildup is not known, but examination of ingot-to-finished-product ratios shows that it may have been as much as 2 million tons in terms of finished steel products.

Of 1953 U. S. ingot production of 111.6 million tons, it appears that roughly 105 million tons of steel actually were used, or shipped overseas to various foreign countries.

What About the Future?

But what about the steel outlook for 1955-59? What finished steel shipments and ingot production might be expected as an average, if 1955-59 should turn out to be a good business period comparable to 1949-52? What might be anticipated for 1957, if it proved to be a year of peak consumption with no sizable change in steel inventories? What would happen in such a year if considerable inventory building were superimposed on a peak steel consumption level?

It is always risky to project past trends into the future or to assume that past relationships will remain constant under changing conditions. For reasonably short periods ahead, however, and for such major industries as steel, with broadly based demand for

Economic Indicators and Steel Output, Shipments

Year	Gross National Product (billions of dollars, 1953)	Federal Reserve Production Index	Population 14 Yrs. and Over (millions)	Labor Force (millions)	Pct Unemployed	Steel Ingot Production (millions of tons)	Finished Steel Shipments (millions of tons)
1949	294	97	111.1	62.1	5.5	78.0	58.1
1950	320	112	112.2	63.1	5.0	96.8	72.2
1951	344	120	113.4	62.9	3.0	105.2	78.9
1952	354	124	114.6	63.0	2.7	93.2	68.0
1949-52 Average	328	113	112.8	62.8	4.0	93.3	69.3
1953	367	134	116.0	63.0	2.4	111.6	80.2

Sources: Economic Report of the President, January, 1954. Steel industry data from American Iron and Steel Institute.

Important factor in future steel demand is growing volume of highway construction, increased use in buildings . . .

their products and which are not undergoing their period of greatest growth, some reasonably valid projections on a broad basis can be made.

Might Produce 116 Million Tons

An examination of the past suggests that in the 1955-59 period, a good year, one in which unemployment did not exceed 4 pct of the labor force, would result in the shipment of 77 million tons of finished steel. This would require production of about 108 million tons of ingots.

In the same 1955-59 period, a year of peak business volume, with minimum unemployment, might require shipments of as much as 85 million tons of steel, equivalent to 116 million tons of ingots.

Strike, War Effect

A period of peak economic activity, with heavy inventory building such as would occur as the aftermath of a prolonged steel strike or in the early stages of a shooting war, might call for shipm nts of over 90 million tons of finished steel. Shipments of this amount would require production of more than 125 million tons of ingots.

It is probable steel product distribution during 1955-59 will be generally similar to the '49-'52 period (see table p. M-5). Past experience indicates that major changes in steel distribution by consuming markets and by products take place only gradually over a long period of time, except, perhaps, during wartime when some uses are restricted and others greatly stimulated.

Over a short period, changes in steel distribution are far more likely to result from variations in the general level of business activity than from fundamental changes in steel use.

What Changes to Come?

However, it is possible to point out a number of changes which are taking place in steel distribution and which should be considered.

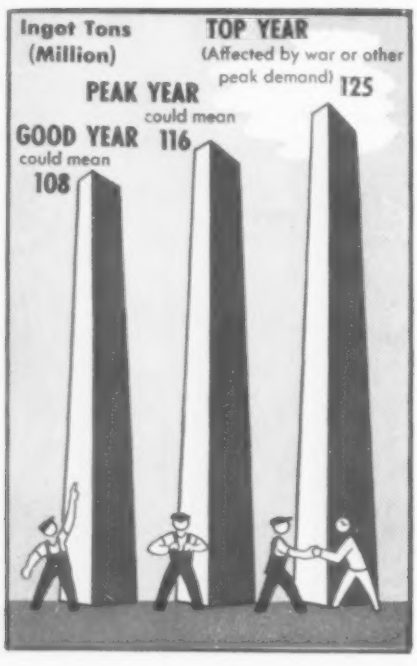
One trend is the continued growth in the market for tin mill products. With an expanding population, a rising standard of living, the ingenuity displayed by those in the container field, more items are being packaged in steel each year. Along with this growth in volume the shifting from hot-dipped tinplate to a greater percentage of electrolytic tinplate is likely to continue.

More Steel for Highways

Another change, already apparent, is the reduction in demand for large diameter linepipe resulting from completion of the major natural gas lines. From now on, with certain exceptions, trunk line expansion will be aimed mainly at serving a growing population rather than carrying out conversion to natural gas.

It is also expected that in the construction field there will be a continued shift from standard structural shapes to wide-flanged beams. This change has been going on for some years and will

POSSIBLE STEEL PRODUCTION 1955-59



What's the Short Term Steel Outlook?

Survey by THE IRON AGE of steel users and producers indicates there may be an upturn in business fairly soon. Main reason steel's comeback has been slower than many expected is that mills grossly underestimated consumers' steel inventories. The much talked about inventory correction may continue for months. Other survey findings:

(1) Recent drop in the ingot rate was not due to a fresh drop in steel demand. Rather it reflects postponement of the expected pickup.

(2) Mills have substantial inventories of ingots and semi-finished steel.

(3) Lead times have been cut sharply. Mills are using their semi-finished stocks to make good on promises of quick delivery.

(4) New order rate is increasing but tonnages are small.

continue slowly, but persistently.

Another important factor in future steel demand is the growing volume of highway construction. Highway construction requires a lot of steel for reinforcement, in bridges, in guard rails, signs and markers, and in forms and various kinds of construction machinery.

Building Use Will Grow

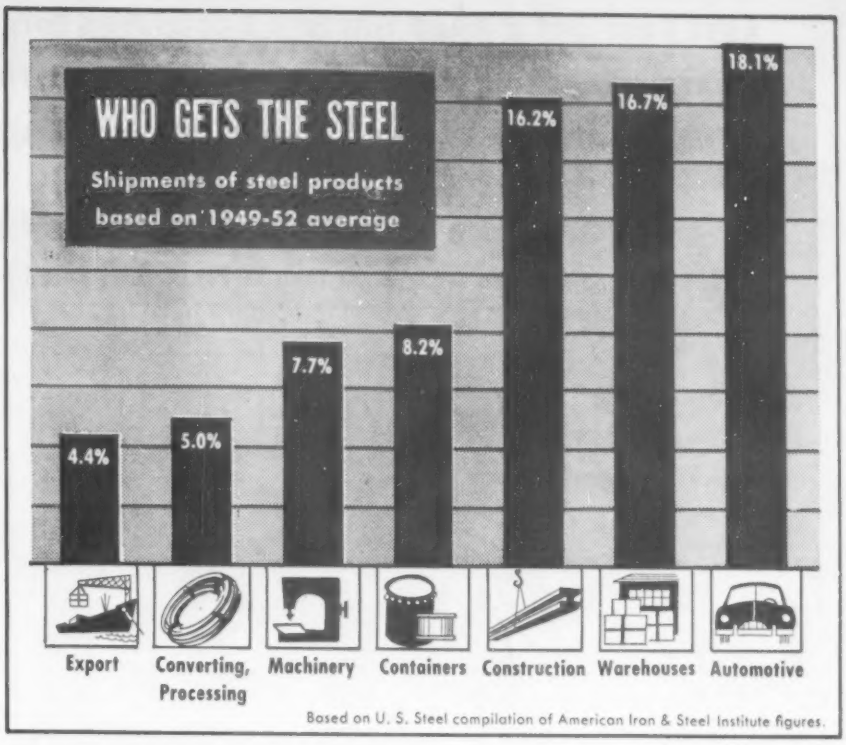
Steel is also likely to find increased use in buildings of all sorts—office buildings, factories, homes. In the past, it has found its major applications in structural members to provide strength, and in building utilities—heating, air conditioning, and plumbing. The future is likely to see greater use of steel to enclose space, in walls, both interior and exterior.

Substitutes Won't Hurt

Another factor in determining future steel markets is the importance of so-called substitute, or competitive materials. But it is virtually impossible to answer the question, "How much steel will be replaced by aluminum, titanium, plastics, wood, or some other material?"

Each material competes vigorously with every other material on the basis of its technical characteristics, production costs and fabrication. The material which is used at any moment for any purpose is that which results in the best and least expensive end product. Such an end product is the most salable one.

All materials benefit from the economic improvement that results when end products are made more marketable by use of materials that at the moment are best suited for a particular application on the basis of their properties and cost. *Turn Page*



WAREHOUSES received an average 16.7 pct of mill steel shipments during 1949-52. Breakdown of steel shipments to warehouses is on p. M-7.

Shipments of Steel Products by Market Classifications

ANNUAL AVERAGE 1949-1952
(Thousands of Tons)

Market Classification	Semi-finished*	Structural Shapes	Plates	Rails, Accessories**	Bars	Pipe and Tubes	Wire Products	Tin Mill Products	Sheets	Strip	Total
Converting and processing	1,332	33	278	7	230	27	915	8	379	287	3,494
Forgings (excluding automotive)	800	.....	10	.....	445	.....	.....	.....	.....	.....	1,255
Bolts, nuts, rivets and screws	278	.....	4	.....	654	.....	323	.....	56	18	1,334
Warehouses (excluding oil field supply jobbers)	115	844	961	35	2,404	2,460	1,672	168	2,590	283	11,594
Construction	146	2,438	1,689	106	1,829	2,501	138	41	2,297	384	11,249
Automotive	440	35	421	.....	2,792	156	292	22	7,103	1,246	12,507
Railroads	40	412	941	2,462	331	27	9	.....	275	37	4,534
Oil and gas drilling (including oil field supply jobbers)	64	40	136	.....	133	1,840	2	.....	30	3	2,250
Agriculture	50	52	136	.....	667	63	28	1	421	122	1,538
Machinery	182	255	1,049	22	1,223	549	238	26	1,362	414	5,320
Appliances and commercial equipment	10	5	21	.....	192	80	341	188	2,090	491	3,398
Containers	7	.....	23	.....	19	7	111	4,026	1,166	338	5,697
Miscellaneous	197	178	709	79	435	99	23	9	283	67	2,059
Export	295	258	230	170	299	563	112	560	545	84	3,076
TOTAL	3,957	4,550	6,590	2,881	11,393	8,372	4,202	5,027	18,577	3,756	69,305

* Includes skelp and wire rods.
** Includes wheels and axles.
Source: U. S. Steel Corp. compilation of American Iron and Steel Institute figures.

Last year hot-dipped tinplate accounted for 1.6 pct of steel shipments compared with 4.2 pct for electrolytic tinplate . . . Trend of increased use of electrolytic, less hot-dipped will continue . . .

SHIPMENTS AND PRODUCTION FOR SALE OF STEEL PRODUCTS

By Companies Who Made More Than 98 Pct of Total Rolled Steel Produced in the U. S.

Steel Products	1953		1952		1951		1950		1949		1948		1947	
	Shipments (N.T.)	Pct of Total	Shipments (N.T.)	Pct of Total	Shipments (N.T.)	Pct of Total	Shipments (N.T.)	Pct of Total	Shipments (N.T.)	Pct of Total	Shipments (N.T.)	Pct of Total	Shipments (N.T.)	Pct of Total
Ingots	918,589	1.1	1,128,070	1.7	1,315,846	1.7	888,324	1.2	2,261,285	3.9	3,150,754	4.8	2,966,748	4.7
Blooms, slabs, billets, tube rounds, sheet bars	2,625,152	3.3	2,301,042	3.4	2,239,747	2.8	2,233,832	3.1						
Skelp	113,397	0.1	107,134	0.2	152,474	0.2	123,388	0.2	118,533	0.2	75,252	0.1	160,989	0.3
Wire Rods	800,648	1.0	741,541	1.1	847,369	1.1	816,555	1.1	570,397	1.0	610,348	0.9	667,282	1.1
Structural shapes (heavy)	5,022,012	6.3	4,138,251	6.1	4,971,970	6.2	4,197,653	5.8	3,669,503	6.3	4,255,355	6.5	4,436,129	7.0
Steel piling	342,894	0.4	234,461	0.3	399,073	0.5	342,277	0.5	301,824	0.5	299,537	0.5	324,224	0.5
Plates	*7,668,274	9.6	7,006,123	10.3	7,910,594	10.0	5,677,094	7.9	5,759,065	9.9	7,000,199	10.6	6,345,216	10.1
Rails—Standard (over 60 lbs.)	1,866,546	2.3	1,348,324	2.0	1,699,042	2.2	1,705,243	2.4	1,772,734	3.0	1,976,520	3.0	2,207,146	3.5
Rails—All other	87,510	0.1	105,704	0.1	120,715	0.2	116,389	0.2	117,154	0.2	214,880	0.3	211,900	0.3
Joint bars	121,102	0.2	109,288	0.1	132,173	0.2	113,676	0.2	118,559	0.2	137,139	0.2	173,923	0.3
Tie plates	425,945	0.5	377,817	0.6	445,932	0.6	416,258	0.6	373,337	0.6	489,434	0.8	504,779	0.8
Track spikes	120,409	0.2	97,634	0.1	158,406	0.2	138,732	0.2	95,345	0.2	145,830	0.2	163,746	0.3
Wheels (rolled or forged)	332,245	0.4	329,825	0.5	386,561	0.2	268,662	0.4	285,733	0.5	337,376	0.5	356,873	0.6
Axles	154,210	0.2	164,230	0.2	221,097	0.3	130,601	0.2	159,628	0.3	215,905	0.3	185,019	0.3
Hot rolled bars (including light shapes)	9,323,429	11.6	8,111,683	11.9	8,930,633	11.3	8,017,465	11.1	6,416,102	11.0	8,123,753	12.3	7,981,848	12.7
Hot rolled bars—Reinforcing	1,848,851	2.3	1,813,146	2.7	1,900,125	2.4	1,674,079	2.3	1,572,588	2.7	1,541,966	2.3	1,452,908	2.3
Cold finished bars	2,194,375	2.7	1,922,205	2.8	1,935,823	2.5	1,624,845	2.2	1,213,052	2.1	1,593,967	2.4	1,645,503	2.6
Tool steel bars	116,152	0.1	120,687	0.2	171,056	0.2	89,863	0.1	57,395	0.1	88,376	0.1	87,279	0.1
Standard pipe	2,801,820	3.5	2,425,351	3.6	2,933,321	3.7	2,599,818	3.6	2,090,445	3.6				
Oil country goods	2,019,345	2.5	1,610,132	2.4	1,879,216	2.4	1,692,821	2.3	1,365,982	2.3				
Line pipe	3,507,318	4.4	2,882,061	4.2	3,186,838	4.0	3,668,511	5.1	2,534,423	4.4	6,881,549	10.4	6,117,884	9.7
Mechanical tubing	*1,089,480	1.4	945,314	1.4	980,066	1.2	743,892	1.0	944,370	1.7				
Pressure tubing	440,675	0.6	417,550	0.6	332,430	0.4	248,798	0.3						
Wire—Drawn	2,826,744	3.5	2,638,562	3.9	3,219,829	4.1	2,867,476	4.0	2,138,878	3.7	2,673,276	4.1	2,590,963	4.1
Wire—Nails and staples	526,935	0.7	651,447	1.0	864,833	1.1	874,470	1.2	731,356	1.3	859,540	1.3	799,436	1.3
Wire—Barbed and twisted	163,801	0.2	240,733	0.3	237,805	0.3	237,604	0.3	215,047	0.4	254,629	0.4	256,991	0.4
Wire—Woven wire fence	245,264	0.3	331,405	0.5	416,704	0.5	483,920	0.7	358,162	0.6	399,457	0.6	407,295	0.6
Wire—Bale ties	37,945		57,766	0.1	110,407	0.1	83,831	0.1	42,828	0.1	113,892	0.2	119,917	0.2
Black plate	748,889	0.9	879,931	1.3	1,076,296	1.4	562,077	0.8	452,041	0.8	838,666	1.3	820,997	1.3
Tin and terne plate—Hot dipped	1,318,080	1.6	1,365,590	2.0	1,628,562	2.1	1,911,568	2.7	1,699,355	2.9	2,167,912	3.3	2,093,140	3.3
Tin plate—Electrolytic	3,343,458	4.2	2,817,449	4.1	2,887,129	3.7	2,840,599	3.9	1,993,468	3.4	1,784,288	2.7	1,617,659	2.6
Sheets—Hot rolled	*7,742,609	9.7	6,098,899	9.0	8,170,733	10.3	7,804,948	10.8	6,192,610	10.7	7,786,056	11.8	7,891,798	12.5
Sheets—Cold rolled	11,274,369	14.1	8,009,255	11.8	9,640,960	12.2	9,338,312	12.9	6,886,946	11.8	6,867,775	10.4	5,504,578	8.7
Sheets—Galvanized	2,290,868	2.9	1,961,158	2.9	1,984,961	2.5	2,262,041	3.1	1,755,067	3.0	1,643,337	2.5	1,609,881	2.5
Sheets—All other coated	253,946	0.3	206,332	0.3	257,195	0.3	237,941	0.3	151,118	0.3				
Sheets—Enameling	228,938	0.3	149,108	0.2	182,187	0.2	256,766	0.4	162,815	0.3				
Electrical sheets and strip	820,096	1.0	607,076	0.9	757,861	1.0	716,592	1.0	*379,180	0.6				
Strip—Hot rolled	2,221,462	2.8	1,837,086	2.7	2,206,978	2.8	2,330,783	3.2	1,674,818	2.9	1,662,787	2.5	1,740,085	2.7
Strip—Cold rolled	2,166,111	2.7	1,714,242	2.5	2,076,003	2.6	1,894,588	2.6	1,465,297	2.5	1,783,383	2.7	1,613,005	2.6
All other									7,570	0.0				
Total steel products	*80,151,893	100.0	68,003,612	100.0	78,928,950	100.0	72,232,292	100.0	58,104,010	100.0	65,973,138	100.0	63,057,150	100.0

* Electrical sheets only in 1949.

Source: American Iron and Steel Institute

STEEL DISTRIBUTION BY CONSUMING INDUSTRIES

In Thousands of Net Tons

	1946		1947		1948		1949		1950		1951		1952		1953	
	Tons	Pct	Tons	Pct	Tons	Pct	Tons	Pct	Tons	Pct	Tons	Pct	Tons	Pct	Tons	Pct
Agriculture	2,100	4.3	2,422	3.84	2,743	4.16	2,644	4.55	3,094	4.28	3,281	4.16	2,764	4.07	2,547	3.18
Aircraft	32	0.06	44	0.07	39	0.06	44	0.08	58	0.08	167	.21	153	0.23	180	0.23
Automotive	7,379	15.1	10,292	16.32	11,330	17.17	11,880	20.45	15,746	21.80	14,488	18.36	12,232	17.99	16,506	20.59
Construction and Maintenance	8,130	16.7	10,039	15.92	10,157	15.40	10,020	17.25	12,363	17.12	14,184	17.98	11,749	17.28	14,225	17.75
Containers	4,749	9.7	5,598	8.87	5,844	8.85	5,026	8.65	6,409	8.87	7,242	9.18	6,218	9.15	6,769	8.45
Machinery, Tools	4,438	9.1	5,648	8.96	5,337	8.09	4,274	7.36	5,812	8.05	7,033	8.92	6,131	9.02	7,307	9.12
Oil, Gas, Water, Mining	2,480	5.1	3,833	6.08	5,080	7.70	5,455	9.39	6,619	9.16	6,735	8.54	5,973	8.78	7,211	8.98
Pressing, Forming, Stamping	3,127	6.4	3,770	5.98	4,256	6.45	3,124	5.38	4,601	6.37	4,617	5.85	3,640	5.35	4,994	6.23
Railroads	4,764	9.8	5,999	9.51	5,866	8.89	4,038	6.95	4,796	6.64	6,558	8.32	4,575	6.73	5,454	6.80
Shipbuilding	320	.64	373	.59	716	1.09	722	1.24	355	.49	981	1.25	1,152	1.70	976	1.22
Exports	3,378	6.9	4,639	7.36	3,578	5.42	3,798	6.54	2,783	3.85	3,068	3.89	3,665	5.39	2,998	3.74
All Others	7,879	16.2	10,402	16.50	11,029	16.72	7,077	12.18	9,560	13.29	10,573	13.40	9,750	14.34	10,985	13.71
Total	48,776	100.00	63,057	100.00	65,973	100.00	58,104	100.00	72,233	100.00	78,929	100.00	68,004	100.00	80,152	100.00

IRON AGE compilation and distribution formula from data by American Iron and Steel Institute

Shipments of Steel Products to Warehouses

HOT ROLLED STRIP

	Shipments to Warehouses	Total Mill Shipments	Percent of Total
1953	182,419	2,221,462	8.2
1952	178,994	1,837,086	9.7
1951	179,636	2,208,878	8.1
1950	131,336	2,330,783	5.7
1949	125,079	1,628,917	7.7
1948	142,873	1,568,540	9.1
1947	129,382	1,740,085	7.4

COLD-ROLLED STRIP

	Shipments to Warehouses	Total Mill Shipments	Percent of Total
1953	133,747	2,166,111	6.2
1952	86,482	1,714,242	5.0
1951	115,801	2,076,003	5.6
1950	107,579	1,894,588	5.7
1949	83,534	1,380,477	6.1
1948	91,343	1,519,753	6.0
1947	47,349	1,499,121	3.2

GALVANIZED SHEETS*

	Shipments to Warehouses	Total Mill Shipments	Percent of Total
1953	830,668	2,290,868	36.3
1952	818,478	1,961,158	41.7
1951	731,677	1,984,961	36.9
1950	679,796	2,262,041	30.0
1949	623,897	1,755,067	35.5
1948	481,288	1,643,337	29.3
1947	440,021	1,609,881	27.3
1946	440,457	1,462,063	30.1
1945	647,748	1,695,796	38.2
1944	537,020	1,370,175	39.2
1943	318,674	869,109	36.7
1942	283,196	998,584	28.4
1941	676,835	1,706,050	39.6
1940	733,848	1,586,723	46.2

* 1946-47 includes coated sheets except tinplate and terneplate.

HOT-ROLLED SHEETS

	Shipments to Warehouses	Total Mill Shipments	Percent of Total
1953	1,167,001	7,742,609	15.1
1952	878,334	6,098,899	14.4
1951	1,078,624	8,170,733	13.2
1950	958,910	7,804,948	12.3
1949	673,680	6,211,458	10.9
1948	824,023	6,704,654	12.3
1947	871,393	7,300,881	11.9

COLD-ROLLED SHEETS

	Shipments to Warehouses	Total Mill Shipments	Percent of Total
1953	1,363,387	11,274,389	12.1
1952	1,012,195	8,009,255	12.6
1951	963,176	9,640,980	10.0
1950	902,156	9,338,312	9.7
1949	590,779	6,942,201	8.5
1948	516,273	6,361,378	8.1
1947	459,335	5,504,578	8.3

The Warehouse Share in Steel Distribution

Percentage of total shipments of various steel products sold through warehouses, 5-year average (1949-1953).

Product	Pct	Product	Pct
COLD-ROLLED STRIP	5.5	HOT-ROLLED BARS	15.2
HOT-ROLLED STRIP	7.9	STRUCTURAL SHAPES	19.8
COLD-ROLLED SHEETS	10.6	GALVANIZED SHEETS	37.8
HOT-ROLLED SHEETS	13.2	WIRE AND WIRE PRODUCTS	34.6
PLATES	14.6	PIPE AND TUBING	46.2

TOTAL STEEL PRODUCTS

	Shipments to Warehouses	Total Mill Shipments	Percent of Total
1953	14,774,246	80,151,893	18.43
1952	13,194,922	68,003,612	19.40
1951	14,245,392	78,928,950	18.05
1950	13,171,680	72,232,292	18.24
1949	10,219,983	58,104,010	17.59
1948	10,949,920	60,966,999	17.96
1947	10,484,144	63,057,150	16.63
1946	9,304,817	48,775,532	19.08
1945	9,571,436	57,242,240	16.72
1944	8,008,076	60,352,690	13.27
1943	6,823,780	59,905,646	11.39
1942	5,962,068	60,464,774	9.86
1941	9,155,160	61,229,873	14.95
1940	6,686,534	45,850,825	14.58
1939	5,179,660	33,122,628	15.63

* 9 Months.

PLATES

	Shipments to Warehouses	Total Mill Shipments	Percent of Total
1953	1,160,629	7,668,274	15.1
1952	1,200,871	7,006,123	17.1
1951	1,088,063	7,910,594	13.8
1950	885,899	5,677,094	15.6
1949	661,348	5,759,065	11.5
1948	822,149	6,762,678	12.2
1947	922,459	6,345,216	14.5
1946	709,728	4,152,181	17.1
1945	745,663	6,841,304	10.9
1944	778,498	11,955,559	6.5
1943	565,662	12,937,230	4.4
1942	456,582	11,612,987	3.9
1941	438,540	5,842,809	7.5
1940	313,663	4,065,383	7.7

HOT-ROLLED BARS

	Shipments to Warehouses	Total Mill Shipments	Percent of Total
1953	1,596,303	9,323,429	17.1
1952	1,300,055	8,111,683	16.0
1951	1,233,134	8,930,633	13.8
1950	1,101,248	8,017,466	13.7
1949	988,695	6,416,102	15.4
1948	1,100,931	6,196,444	17.8
1947	1,219,939	7,983,848	15.3
1946	1,026,873	6,397,137	16.1
1945	1,114,482	5,727,357	19.5
1944	915,527	6,020,484	15.2
1943	923,588	5,982,673	15.4
1942	684,881	5,519,035	12.4
1941	750,821	5,788,821	13.0

PIPE AND TUBING

	Shipments to Warehouses	Total Mill Shipments	Percent of Total
1953	4,565,268	9,858,638	46.3
1952	3,761,882	8,280,408	45.4
1951	4,326,217	9,311,871	46.5
1950	4,078,140	8,922,840	45.7
1949	3,266,231	6,935,220	47.1
1948	3,302,127	6,456,102	51.1
1947	2,825,668	6,117,884	46.2
1946	2,601,500	4,655,505	55.9
1945	2,243,123	5,752,752	39.0
1944	2,084,580	5,259,503	39.1
1943	1,647,543	5,116,671	32.2
1942	1,633,738	4,716,061	34.6
1941	2,692,424	5,588,939	48.7
1940	2,142,147	3,920,200	54.6

WIRE AND WIRE PRODUCTS

	Shipments to Warehouses	Total Mill Shipments	Percent of Total
1953	1,076,173	3,802,689	28.3
1952	1,387,356	3,919,913	35.4
1951	1,705,453	4,849,578	35.2
1950	1,688,618	4,547,301	37.1
1949	1,297,742	3,486,271	37.2
1948	1,559,676	4,300,794	36.3
1947	1,366,090	4,174,602	32.7
1946	1,151,318	3,280,589	35.3
1945	1,248,598	3,228,718	38.7
1944	1,262,525	3,200,882	39.4
1943	1,308,300	3,278,674	39.9
1942	935,104	3,314,381	28.2
1941	1,536,347	3,794,538	40.5
1940	1,054,843	2,589,337	41.1

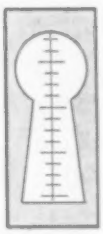
STRUCTURAL SHAPES*

	Shipments to Warehouses	Total Mill Shipments	Percent of Total
1953	1,071,833	5,022,012	21.3
1952	906,550	4,138,251	21.9
1951	909,592	4,921,970	18.5
1950	789,600	4,197,683	18.8
1949	679,719	3,869,503	18.5
1948	772,818	4,190,934	18.4
1947	857,082	4,436,129	19.3
1946	786,681	3,474,284	22.6
1945	917,142	3,763,952	24.4
1944	571,884	3,912,951	14.6
1943	412,727	3,916,128	10.5
1942	410,708	5,280,182	7.8
1941	547,511	4,941,818	11.1
1940	331,523	3,333,450	9.9

* 1940-45 includes piling.

Titanium: 4-Year Old Industry Sees Problems, Bright Future

By C. I. Bradford
Vice-President
and
D. W. Kaufmann
Assistant Sales Manager
Rem-Cru Titanium, Inc.
Midland, Pa.



In commercial production for only 4 years, the titanium picture is still out of focus . . . Demand estimates vary enormously . . . But technical progress was substantial during the past year . . . Prospects are bright—this year should tell much more about just how great its future will be.

TITANIUM doesn't have much of a past—it's too new. But its present is a dynamic constantly-changing picture, and its future is almost overwhelming. A great many words have been written about this metal during the past few months—technical articles by the dozens or perhaps hundreds; news releases, talk of investigations in Nevada, California and Washington, D. C.

Great things have been reported concerning titanium—200 lb or more lopped off the weight of a DC-7, equal to an extra passenger and his luggage; wide usage in planes which have exceeded the speed of sound and in others designed for speeds up to Mach. 3; complete resistance to corrosive attack in solutions which dissolve other metals.

Even greater things have been predicted for titanium in the years to come—military demands involving 100,000 tons in the near future; a potential demand of ten times that much in the event of a national emergency; a civilian demand which is expected to increase steadily and rapidly under the stimulus of falling prices.

Had Too Much

In the face of all of these remarkable reports, perhaps it is well to back off a bit—first to review critically the titanium picture for 1953, and then to look realistically into the future.

Twelve months ago titanium as a ductile metal was barely five years old. Commercial production began in 1950. Late in 1952, the industry produced more titanium than could be used—design had not caught up with a sudden increase in supply.

This condition did not last long. The aircraft engineers quickly took advantage of titanium's combination of light weight, high strength in the intermediate temperature range, resistance to flame and freedom from attack in salt air and salt water and other corrosive media. The ordnance experts piled up knowledge of titanium and its alloys which might have been expected to require years to accumulate. Their use of the metal awaits only an adequate supply. The Navy took a long look at specimens exposed to all types of sea water conditions for as long as five years — specimens which showed no sign of corrosion —and started a number of experimental programs. By March of last year the titanium producers had pretty full order books.

The year 1953 saw the production of 4000-lb ingots on a routine basis. These permitted the rolling of continuous wide sheet coils on modern high-production mills, with resulting improvement in uniformity of surface, size and

C. I. Bradford D. W. Kaufmann

In on the ground floor of titanium development, Mr. Bradford was put in charge of Remington Arms Co.'s pilot production of titanium in 1947. Mr. Kaufmann has held numerous responsible positions with Crucible Steel Co. and was formerly in charge of Crucible's central metallurgical office in Pittsburgh.

The Sponge Makers

Current sponge capacity of the four producers is now about 7680 tons per year. Producers are E. I. Du Pont de Nemours & Co., Titanium Metals Corp. of America, U. S. Bureau of Mines and Cramet Co. Du Pont can now make some 5 tons a day, will double its capacity this month or next.

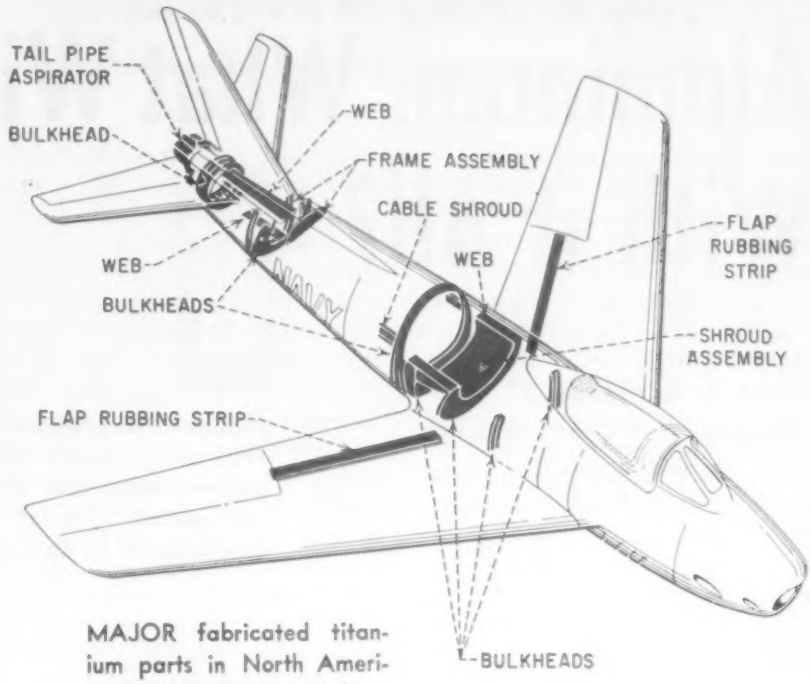
Government contracts now call for procurement of 13,500 tons from Du Pont in 5 years, 18,000 tons from Titanium Metals Corp. in the same time, and between 6000 and 7500 tons from Cramet Co., Crane Co. subsidiary.

The Goal Is High

While many predict annual demand for 100,000 tons of titanium for military use in the near future (Senator Malone goes to 150,000 tons), the Office of Defense Mobilization currently has set 37,500 tons as an interim goal. It seeks to have available facilities for melting this tonnage of sponge or scrap by 1956.

Congressional concern has set wheels in motion for a survey to determine actual defense needs and work out a timetable. So Office of Defense Mobilization is setting up a study committee under H. H. Kellogg, chairman of Columbia University's School of Engineering.

Aircraft's Use of Titanium



MAJOR fabricated titanium parts in North American's FJ-2 Fury jet fighter.

flatness. Alloy sheet with twice the strength of commercially pure titanium at 500-600°F became a standard production item; and late in the year a weldable alloy with outstanding strength at temperatures around 1000°F was announced.

During these months the increasing need for an adequate supply of titanium and the interest of Sen. George W. Malone (R., Nev.) focused attention on the future. The testimony of those concerned brought out the following facts:

1. Military demand for titanium products should require at least 35,000 tons of titanium sponge in 1956 and 1957.

2. ODM approval has been obtained for a 37,500-ton per year interim goal. (See Box.)

3. Prompt action to study this program of sponge production is in order—and such action will bring the entire picture into sharper focus. (See Box.)

Thus we see in 1953 a year of remarkable accomplishments in the manufacture and use of titanium. For the future we see a need for rapid expansion. For 1954 the picture is not too clear.

Once again the titanium producers have demonstrated their ability to process increased amounts of sponge as fast as it is made available to them. The recent four-fold increase in the capacity of one of the sponge makers is now a reality but unless releases are obtained immediately for production applications, defense officials will find themselves in the paradoxical situation of controlling and allocating the distribution of a metal which is being over-produced.

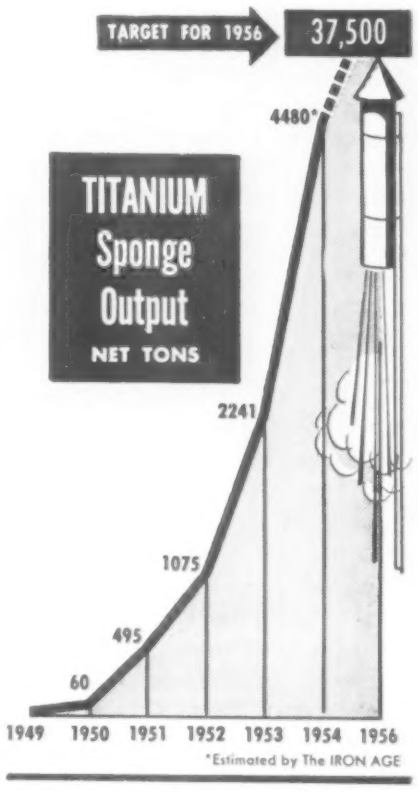
The reason for this strange condition lies in the fact that the present sponge production methods and expansion programs result in quick jumps in the production level rather than a steady even increase. The aircraft engineer is reluctant to assume that material will be available to him until concrete evidence to that effect is available. Now that the increased supply is here he will design accordingly, but six to twelve months are required for his actions to affect procurement.

Reserve for Industry

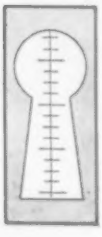
Business & Defense Services Administration is now considering issuance of an order which would reserve a percentage of titanium mill products for industrial use.

Spokesmen for the industry, including both producers and fabricators, have reported to the government that the military take of titanium for aircraft frames and engines has not kept pace with expansion of production facilities.

Industry feels that some should be turned loose for use in making civilian products and thus begin to develop a civilian market.



Aluminum: What Will We Do With it All?



By D. P. Reynolds
Vice-president in Charge of Sales
Reynolds Metals Co.
Louisville, Ky.

Though 1953 production was almost double the 1950 figure, 1954 will probably see a further gain of 12 pct. This means assured supply for civilian needs. This, with stable prices, will permit greater promotion of present uses, permit development of new ones.

MORE aluminum will be consumed in the years immediately ahead than ever before. This is a prediction—but a confident one. There are numerous new uses of aluminum that have been thoroughly tested. Development and promotion of these new products have been held in suspense in recent years because a shortage of the metal was created as result of abnormal arms requirements.

Indications are that the pattern for aluminum consumption is developing along this line: Transportation 27 pct, architectural and construction 19 pct, appliance and equipment 13 pct, electrical and communications 11 pct, machinery and equipment 11 pct, packaging industry 5 pct, paint and chemical together with destructive uses such as deoxidizing steel 7 pct, and miscellaneous uses 7 pct.

BIG DIFFERENCE

If aluminum were to find a new application that boosted sales by some 125,000 tons a year it would be tremendous—a 10-pct gain, to be specific. But a new use for steel calling for an extra 125,000 tons a year would add only 1/10th of one pct to annual sales. Yet aluminum is the world's No. 2 metal in terms of output and use.

Production facilities of the primary producers of virgin aluminum have been so greatly expanded in the last 3 years that production in 1953 totaled 1,252,015 tons, which is almost double the output in 1950. It is anticipated that 1954 production will be 12 pct greater than last year. The major factor in this increase is that new reduction plants went into operation late in 1953 and did not attain maximum production.

There are a number of uses for aluminum that have been demonstrated as economical and practical in which the quantity used has been curtailed because there was no assurance that aluminum would always be available in the quantity desired. Now that users know they can get it when they need it, it is possible confidently to forecast that consumption for established uses will be expanded.

Availability is certain to stimulate research and developments in other applications of aluminum by industrial users familiar with its diverse characteristics. These include: Light weight, strength, corrosion resistance, consumer appeal, machinability, weldability, electrical and thermal conductivity, non-magnetic and non-sparking properties, reflectivity, resistance to many chemicals, and non-toxic effect on the human system.

The price of aluminum is an added inducement to increasing sales. Aluminum ingot costs only 7½ pct more than in 1939. In contrast, steel prices as of Jan. 1, 1954 had doubled; zinc increased by 90 pct; lead by more than 167 pct, and copper prices rose more than 165 pct since their 1939 average. This history of price stability permits users of aluminum to plan for increased use with reasonable assurance.

Transport May Be No. 1 User

It is quite probable that the transportation industry will be the largest user of aluminum in the immediate future. Perhaps as much as 27 pct of aluminum will find its way into this field, with aircraft using slightly more than half of the total. The automotive industry is likely to use more aluminum than ever — but of course more will be available than ever before. So an estimate of 10 pct of total aluminum production going to the automotive phase of transportation is conservative. The automotive field provides an example of an industry that has been cautious about integrating aluminum into its production to an increased extent because assurance could not be given that all the metal wanted would be available as it was required. It has been proved by experience that aluminum is the most efficient material

DAVID P. REYNOLDS really knows aluminum. He started as a foil salesman for the company 17 years ago. He's handled advertising, public relations and has held his present position for the past 6 years.

for pistons and heads. In fact, all cars produced in 1953 had aluminum pistons. Much aluminum is required in the automatic transmission for cars and the metal is recognized as standard for this purpose. Some models, equipped with automatic transmission cases contain 25 to 40 lb of aluminum because it has proved to be the best and most practical material for this purpose. Much experimenting has been done in adapting aluminum to the fabrication of auto radiators. The results have been satisfactory enough to indicate that this field has prospects for increased use of the metal. Aluminum is being increasingly used as motor car trim and it has been demonstrated to be superior for carburetors. Aluminum is ideally adapted to the fabrication of such phases of transportation as truck trailers, bus panels, structure and window frames.

See 19 Pct for Building

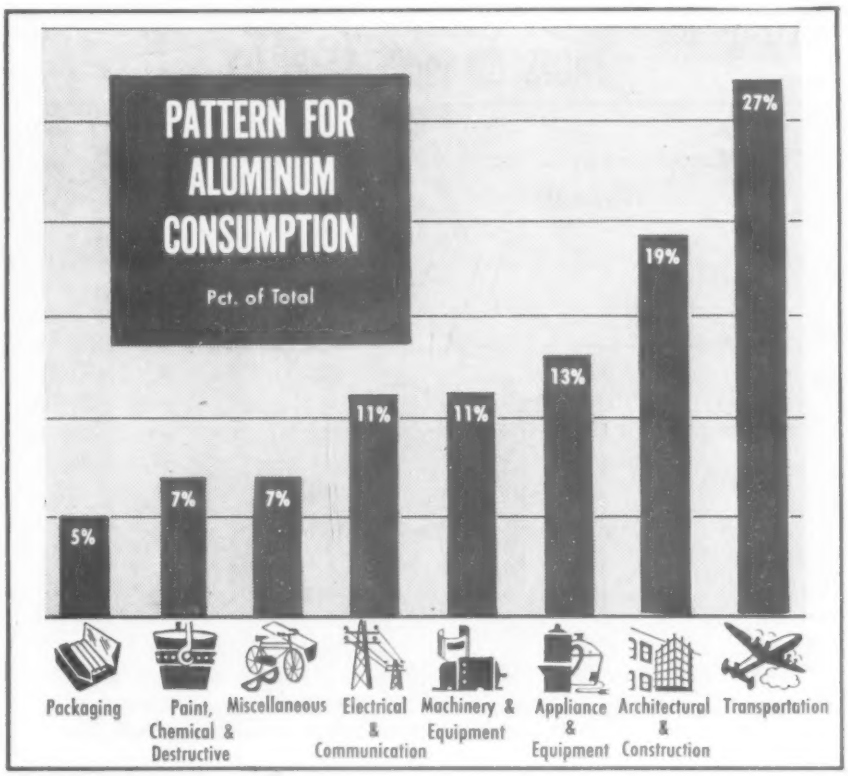
There is an accelerated demand for aluminum in the architectural and construction sphere. It could be that the highest percentage of increased use of the metal would occur in this and related fields. It can be forecast with assurance that as much as 19 pct of the output will be used in this classification. This is another area in which aluminum is highly adaptable, yet its use has been curtailed by uncertainty that it could be obtained.

"There is a pronounced trend toward increased use in the building industry . . . curtain walls, roofing, ductwork, screens . . ."

Windows present a conspicuous example of the readiness with which aluminum has been accepted in architecture and construction. Only 5 pct of all window frames were made of aluminum in 1949. Last year 25 pct of all window frames were fabricated of aluminum. There is a pronounced trend toward increased use of aluminum throughout the entire building industry. Curtain wall construction is one of the most exciting prospects. Use of this type of fabricated aluminum in large commercial structures has revealed it not only to be practical but highly efficient in cutting construction costs. Then too, maintenance costs of such buildings will be reduced.

Other major uses within the architectural classification which are growing steadily include roofing, siding, heating and ventilating ductwork, store fronts, builders' hardware, screens, doors and bridge railing.

Appliance and equipment manufacturers are likely to use about 13 pct of total aluminum production. It might exceed that figure substantially if manufacturers of air conditioning equipment are as successful in extending distribution of this product as they expect to be. Many producers of air conditioning equipment use aluminum in their units and now that the metal can be readily obtained it is likely that more of it will be used. In 1952 there were 375,000 room air conditioner units sold. It increased to 1,300,000 units in 1953. It is quite possible that the 1954 output may advance to 2,300,000 units. There is an average of about 6 lb of aluminum in these room units. There will be an increase in the output of large air conditioning units such as used in office buildings, restaurants, and industrial offices. So it is not improbable that this industry will increase aluminum consumption to such a degree as to raise the per-



"Has advantages for fans, heat exchangers, condensers, materials handling units . . ."

centage of aluminum going to this phase of production above the prior estimate of 13 pct. Refrigerators, freezers, washing machines, vacuum cleaners, stoves, radio, television sets and antennas, cooking utensils, venetian blinds and furniture are the foremost uses in the appliance and equipment classification. Aluminum can be so profitably adapted to this range of commodities that one may expect an enlarged volume in this market.

Cable Will Remain Strong

It is highly probable that the electrical and communications industries will consume 11 pct of the aluminum output. Electrical transmission lines, ACSR cable and accompanying accessories will continue to be a major consumer. Electrical equipment, including as major items motors, generators, transformers and wiring devices, will use enlarged amounts of the metal which has been proved to offer signal advantages. Electronics and communications engineers have been designing their equipment more and more toward aluminum.

About 11 pct of the virgin aluminum output will be absorbed by a classification designated as machinery and equipment. Farmers have found that the installation of an aluminum portable irrigation system is a profitable investment and installations of this sort should be in increased number this year. There are many commodities that come within this classification including nails and other fasteners, tools, toys, gas, electric and water meters, and rockets. The industrial field has become increasingly aware of the advantages aluminum offers for its machinery, materials handling equipment, fans and blowers, heat exchanger and condensers, and numerous other specialized components.

Foil to Take 5 Pct

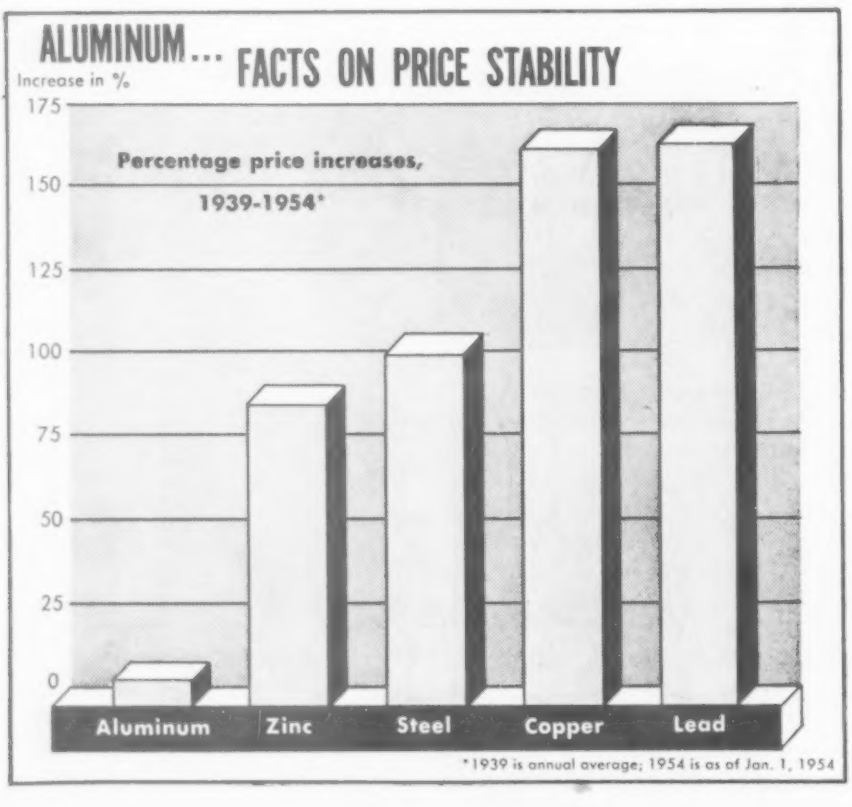
Use of aluminum foil in the packaging industry continues to mount as its adaptability is recognized. About 5 pct of aluminum will be used for this purpose. Aluminum foil is the logical packaging material for frozen foods. Development of this method of food distribution has given impetus to foil as packaging material. Butter and oleomargarine, cigarettes, chewing gum, and candy have generally accepted aluminum foil. More progressive members of the bakery industry have recently found aluminum foil the solution to packaging problems for many of their products. The growth of the self-service supermarket has given added impetus to the use of aluminum foil protective packaging. Its bright, colorful, and attractive appearance makes the foil package an excellent silent salesman.

Miscellaneous Uses Rise

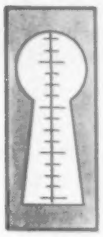
The paint and chemical industry, plus aluminum going into destructive uses such as deoxidizing steel and alloying other metals, may be expected to take 7 pct of the year's aluminum. Then there are numerous miscellaneous uses, the volume and variety of which are growing steadily, which may use as much as 7 pct of the year's output.

Various household uses of aluminum are growing steadily. Millions of housewives regard aluminum household foil as something they are unwilling to be without. Since soft aluminum can be worked with ordinary wood-working tools it is now moving into the home handicraft field. This acceptance of aluminum in the home is creating an aluminum consciousness in millions of households. As they become increasingly familiar with its qualities the uses of the material will be multiplied. When a new house is to be built architects will be directed to make greater use of the metal.

The American people are becoming increasingly aluminum conscious . . . increasingly aware of the versatile qualities of a metal that has awakened their productive imagination. As a consequence the miscellaneous use of the metal is limited only by human ingenuity and the extent to which it is stimulated.



Magnesium: Supply Unlimited, Growth Just Starting



As long as there's a sea, magnesium supply will never be a problem . . . But technical improvements are needed in alloying and fabrication before the metal reaches full potential use . . . Consumer market biggest for the future.

By D. T. Surprenant
Market Research Dept.
The Dow Chemical Co.
Midland, Mich.

MAGNESIUM'S future is unclouded by the usual limitations of raw material supply which some day will plague many other metals. This light metal could be produced from the sea at the rate of 100 million tons annually for 1 million years and reduce the magnesium content of seawater only from 0.13 pct to 0.12 pct.

In terms of pounds, each cubic mile of seawater contains 12 billion lb of magnesium metal. Little more than one-eighth of a cubic mile of seawater could supply all the magnesium produced in the world from the time of its isolation in 1808 to the present.

Since supply is not a problem, the metal's future depends largely on two other factors—production capacity and demand. It is safe to assume that production facilities will be created to keep pace with increasing requirements, which leaves demand as the unknown variable.

Have to Be Vague

Forecasts of demand have to be vague since magnesium's future will be determined greatly by technological developments which may increase its use. The Paley Report, for example, states:

"Magnesium can be obtained at moderate cost in unlimited amounts, but its large-scale use awaits technical improvement in alloying and fabricating the metal. If these improvements can be achieved, there will be a tremendous future for magnesium, especially as a structural metal. Even without these improvements, a substantial use of magnesium can still be expected in special applications based on its chemical properties or on its light weight."

Preliminary estimates by Bureau of Mines indicate national consumption of primary magnesium in 1953 remained at about the same level as in 1952, or approximately 40,000 tons. Increased use in civilian applications during the past year was counterbalanced by decreased military requirements resulting from defense cutbacks.

More for Civilian Use

The reduction in defense requirements, however, is expected to make more mill products available and to increase fabricating facilities which may broaden civilian markets in the immediate future.

Magnesium's major market at present is the transportation industry. During 1953, air and ground transportation industries accounted for 38 pct of total mag-

AFTER working in Dow Chemical Co.'s metallurgical laboratories, Donald Surprenant joined the firm's market research department early in 1952. Mr. Surprenant is a graduate of Rensselaer Polytechnic Institute.

Even without the technological advances that are needed, magnesium's lightweight insures increasing use . . .

Magnesium's lightweight makes it a natural for use in any equipment which moves or has to be moved by manpower . . .

nesium consumption. Military and civilian aircraft, making use of magnesium's light weight, alone accounted for 33 pct of overall consumption.

Historically, sand-cast landing wheels and engine parts were among the earliest uses of magnesium in aircraft manufacture and are still among its most important.

Applications for sheet and extrusions in civilian aircraft structures and covering will grow substantially as more material is released for civilian markets, will be speeded by the recent availability of wider and longer sheet and large extrusions.

More Magnesium in the Air

Use of airborne equipment, especially radar, has grown tremendously (three-fold in some aircraft) over the past 5 years. Should this growth continue, potential consumption of 3-5 million lb of both cast and wrought products by 1960 is not hard to visualize.

Limited availability of wrought magnesium products for commercial use since 1950 has hindered development of the potentially huge market in land transportation, particularly trucks and trailers. More favorable sheet prices, plus technological improvements and easing availability may raise consumption of this market to 2-3 million lb in 4 or 5 years.

Price Is Main Factor

Use of magnesium by the auto industry has recently been at an annual rate of about 1.5 million lb. Acceptance of magnesium by automakers is based solely upon price considerations, so increased use of the metal by this industry will depend upon relative prices of competing metals.

Second largest magnesium consumer is the aluminum industry, which uses magnesium for alloying purposes at the approximate proportion of 0.5-1.0 pct of the total aluminum consumption. Use of magnesium by this industry is obviously closely tied to potential demand for aluminum.

Government predictions of annual aluminum demand of 3.6 million tons by 1975 indicate a yearly potential use of about 18,000 to 36,000 tons of magnesium by the aluminum industry 25 years from now.

Offers Protection

Magnesium's inherent electrochemical properties provide excellent cathodic protection. In this application, the metal is used sacrificially to protect underground pipelines, hot water heaters, ship hulls, large industrial tanks and other steel structures from corrosion.

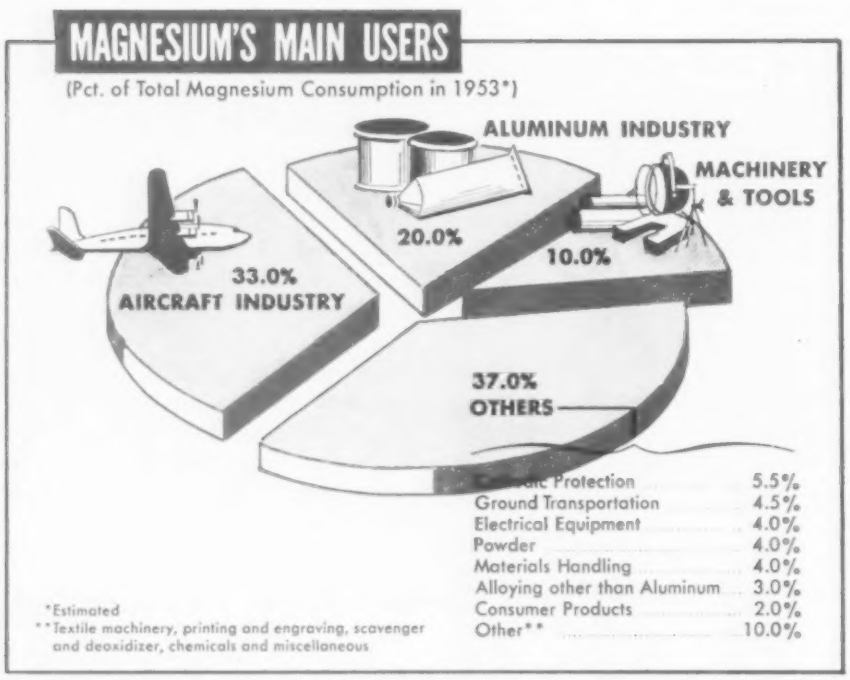
In some years, as much as 20 pct of all magnesium production has been consumed for protective purposes. By 1962, it is estimated that nearly 17 pct of all magnesium products (excluding ingot) will be in the form of either cast or extruded anodes.

Another promising application for magnesium's electrochemical properties is the dry cell battery. Although now only in experimental and developmental stages, magnesium dry cells provide a theoretical potential consumption of about 8000 tons per year.

If It Moves . . .

Any equipment which moves or has to be moved by man-power is a target for improvement through use of lightweight magnesium. Dock-boards, hand trucks, shipping pallets, conveyors, ladders, hand tools and a myriad of similar items are now being made of magnesium.

Although only 14-15 pct of total magnesium consumption today goes into portable equipment and tools, this field has barely been touched and could easily grow to



POTENTIALLY huge magnesium market in land transportation last year accounted for only 4.5 pct of consumption. This will expand considerably as wrought magnesium products become more available.

40,000 or 50,000-ton proportions in 10 years.

In addition to these major applications, greater use of magnesium can be expected in printing and engraving, business machines, textile machinery, consumer goods and in the manufacture of magnesium powder, nodular iron, in addition to titanium and zirconium.

Use Was Slowed

Use of magnesium in graphic arts should reach 1000 to 2000 tons by 1960. Ultimate potential in this field is more than 6000 tons.

Retarded use of magnesium in textile machinery has been due to technological difficulties, but demand by this industry should expand to 300 to 500 tons in 5 or 6 years.

Consumer Market Greatest

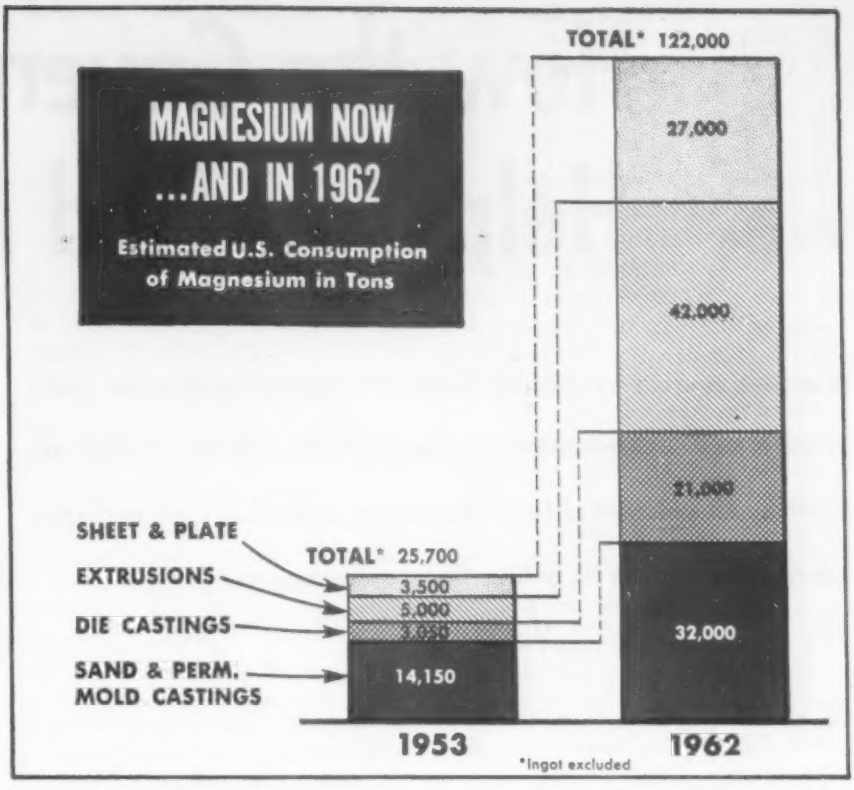
Depending upon technical progress made, annual titanium production is estimated between 500,000 to 2 million tons by 1975. If no improved method replaces the Kroll process, magnesium consumption for titanium production alone would be between 650,000 and 2.6 million tons in another 25 years.

Although now small in volume, consumer applications probably offer the largest ultimate market because of the many products in which magnesium could be used.

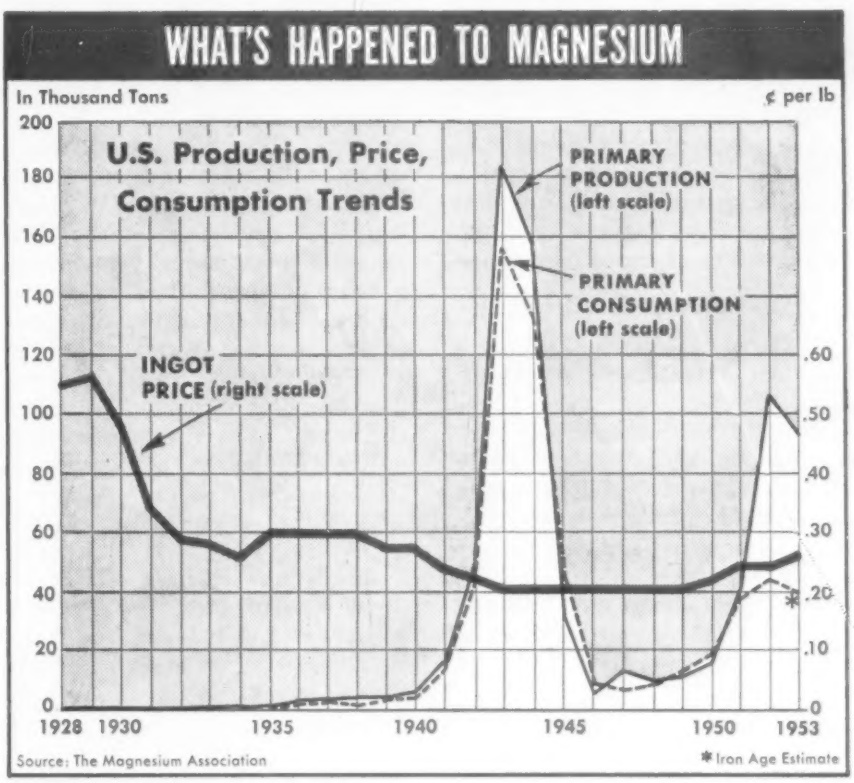
Estimate Future Use

In summing up potential magnesium demand the Paley Report states: "Because magnesium can be produced in unlimited quantities from domestic resources, it is especially attractive from a security point of view . . . Whether peacetime commercial demand will grow to hundreds of thousands of tons annually depends on whether various technologic and economic advances are made."

Whatever its rate of growth, magnesium seems destined to play an increasingly important role among the leading commercial metals.



U. S. CONSUMPTION of magnesium mill and foundry products is expected to rise from 1953's 25,700 tons to 122,000 tons in 1962. Greatest increase will be made in consumption of extrusions, with sheet and plate expected to be next in line.



DIFFERENCE between primary magnesium production and consumption since 1951, as shown on this chart, is a result of government stockpiling. Since July, 1953, the stockpiling rate has been drastically reduced.

How the Government Can Help You Find Markets

In recent years, emphasis has been on attaining production goals. Stress is now on distribution and consumption . . . Business & Defense Services Administration helps industry by supplying vital marketing information through its publications, consultations.

By H. W. Ketchum
Acting Director
Office of Distribution
Dept. of Commerce

MARKETING challenge for industry is now greater than it's ever been. There are more people in business (4 million firms), and with population at 161 million there are more potential customers. Added to this—dispensable personal income and individual savings are both at record levels.

America's productive capacity is also greater than ever before and is still expanding. Continuing technological advance, increasing productivity per worker, and a more effective system of distribution together can support a standard of living far beyond the peak of 1953. In meeting this challenge the part played by those engaged in distribution will be of major importance.

Government Can Help

In the past few years, emphasis has been on attaining production goals. It will now have to be shifted to distribution and consumption goals. Only by expanding markets and increasing per-capita consumption can our growing industrial capacity and labor force be fully utilized.

Many companies have already recognized that a new set of business conditions exists and are overhauling and expanding their market research and sales organizations to meet stiffer competition in a buyers' market.

Improvement of marketing and distribution facilities and techniques along with reduced costs are an important part of the answer. And there is much the government, particularly the Dept. of Commerce, can do in the field of marketing and distribution to help business maintain economic stability and growth through market expansion.

To supply this help the Business and Defense Services Administration of the Dept. of Commerce was established 6 months ago under Charles Honeywell.

BDSA has three major parts. Basic is its group of 25 Industry Divisions, which have identical charters. Together these divisions continue the necessary defense and mobilization functions of the former NPA, including defense planning and plant security measures.

Each of these divisions represents a major segment of American industry in its relations with the government and presents the industry's point of view. The industry groups also provide service to business in a variety of ways, many related to distribution.

Represents Industry

Among the services offered by these divisions are: Development and analysis of industry and trade statistics on production and marketing; studies on the size and location of markets; and special studies or surveys of particular products or problems accomplished in cooperation with trade associations and various industry groups.

Members of the staff of these divisions are available for consultation on problems such as quality or application of industry products, new developments and uses of materials, information on new products and conditions of foreign supply and markets.

Included within the 25 Industry Divisions of BDSA are 11 grouped under the direction of Assistant Administrator W. Elmer Pothen, which are of primary interest to the metalworking industry.

Offers Help

Primary job of the Office of Technical Services, a second major unit within BDSA, is to disseminate technical knowledge gained from government sponsored research in the form of technical reports to industry.

Approximately 250,000 such reports have been collected and indexed by this office and are distributed to businessmen at nominal cost. A monthly *Bibliography of Technical Reports* is issued on a subscription basis, or may be consulted in Dept. of Commerce Field Offices.

Other activities of the Office of Technical Services include assistance to industry in simplifying commercial practices and adopting uniform commercial standards; distribution of information on nonprofit business organizations, and services to state agencies and local

Office of Distribution provides industry with data on market research, distribution costs . . .

ACTING DIRECTOR of the Office of Distribution since 1947, Harry Ketchum was formerly professor of economics and dean and director, School of Social Science & Public Affairs, American University, Washington, D. C.

organizations in connection with industrial development.

The Office of Distribution (OD) is the third organizational group which rounds out BDSA. Its efforts are directed toward assisting those engaged in any phase of distribution.

What OD Covers

Work of the Office of Distribution includes market research and development, cost analysis, sales promotion, advertising, new product development, wholesale and retail operations, warehousing, credit extension and collection, retailer-consumer relations, and a host of other specialties.

A large part of OD's activity is to alert business and industry to the wealth of market information and data available from government, commercial and educational sources.

Help Locate Markets

Most businessmen are familiar with the basic statistical programs of the Bureau of the Census and the Office of Business Economics of the Dept. of Commerce; the Bureau of Labor Statistics of the Dept. of Labor; and other agencies which provide basic data on economic trends and activities.

Many are less familiar with the wealth of statistical information which grows out of the administrative or regulatory functions of government agencies such as the Securities & Exchange Commission, the Bureau of Internal Revenue, the Federal Reserve Board, or the Bureau of Old Age and Survivors Insurance.

List Information Sources

Basic statistical data from these and other agencies developed as a by-product of administrative or regulatory functions provide valuable information for use in locating and measuring markets, and as guides for determining sales potentials and quotas.

As a part of its program to disseminate market information, the Office of Distribution last month began to issue a monthly *Distribution Data Guide* identifying important government and private publications in the distribution field. Listings are annotated and include information on content, availability and price.

It is expected that succeeding monthly issues will be combined into an annual compilation listing sources of significant information on the major aspects of marketing and distribution.

In operation, the program of the Office of Distribution is divided into three major fields: (1) Market research and development, (2) marketing operations, and (3) distribution costs. Activities in each field range from basic research to industry consultations.

Main objective of OD's work in market research and development is to help business and industry establish effective marketing methods for measuring the size and location of market potentials. Emphasis is placed on stimulating increased availability and use of realistic facts in planning sales quotas by geographical areas.

Cover Market Statistics

Assistance in this field is provided through promoting preparation and dissemination of information on the availability and use of market statistics, through the preparation of information source lists by subjects, through personal consultations, and through studies and publication of material developed.

Selling the U. S. Market, one of the department's more recent publications in this field, is an example of this type of activity.

Not Enough Information

In the field of distribution costs, OD collects and makes available information to assist those engaged in distribution evaluate individual performance on the basis of stand-

What O.D. Can Do for You

Main function of the Office of Distribution is to provide industry with information on marketing. One of the many ways it helps is through personal consultations. Here are typical examples from O.D. files:

(1) Steel company obtained advice on analyzing the structural steel market on a regional basis, including development and use of statistics and other market analysis techniques.

(2) A large company recently got help on methods of setting up a market research department to measure sales potentials by counties and to forecast sales.

(3) It helped a new manufacturer set up a discount schedule for various classes of distributors, provided information on market outlets.

ard figures and management yardsticks.

The collection, analysis, and publication of distribution cost data by types of business and for individual commodities depends largely on the cooperation of trade groups and associations, as well as commercial establishments which provide specialized survey data.

Accurate information on distribution costs and acceptable methods of distribution cost measurement and analysis are woefully inadequate today in view of the importance of marketing in sustaining a high level of production, business activity, and employment.

A major objective of the OD in this field is to help promote better public understanding of distribution costs in relation to values added by distribution and functions performed. It also provides guidance to the government in programs or policies relating to distribution costs.

The marketing operations staff handles a wide variety of inquiries on individual operating problems from firms in the wholesale, retail and service trades.

An important part of this activity is the preparation, in cooperation with trade groups, of various types of publications covering establishment and operation of specific types of businesses. These reports highlight the major problems encountered in entering a business and provide a checklist of factors for special consideration before risking capital.

Comprehensive basic reference source-lists on a wide range of subjects, covering both governmental and nongovernmental publications, and a series of brief marketing "aids" for businessmen are also prepared.

This assortment of marketing information reaches the businessman through various Commerce publications, through the services of its 33 field offices, in reply to letters, or through personal consultations with the OD Staff.

Along with its program of research and inquiry service, the Office of Distribution advises Commerce Dept. officials on issues of public policy relating to distribution, reviews current and proposed legislation affecting distribution and represents the distribution industries in numerous government councils.

Overall the Dept. of Commerce's program of service to industries in the distribution field as carried out by BDSA through its Office of Distribution is designed to help business and industry answer the challenge of profitably marketing increased production.

Who to Call at BDSA

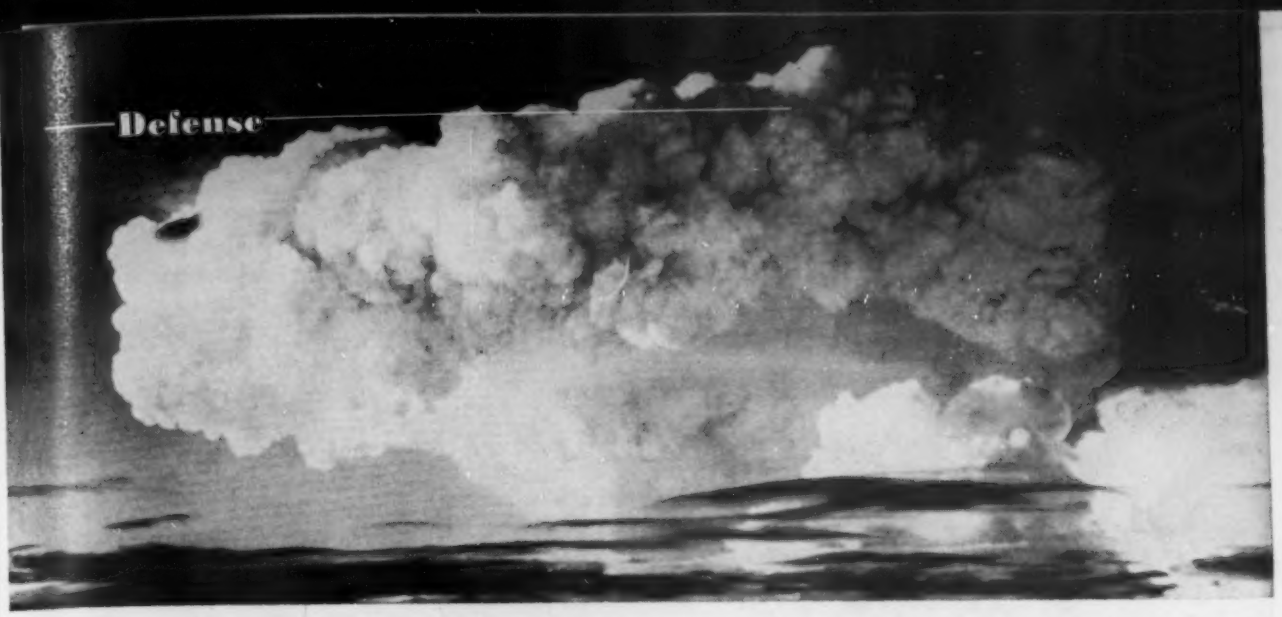
Who's Who in Business & Defense Services Administration offices pertaining to the metalworking industry. BDSA is located at 14th & Constitution Aves., Washington, D. C.

Phone: STerling 3-9200

	Room	Ext.
Administrator: C. F. Honeywell	4848	4913
Deputy Administrator: H. B. McCoy	4838	8112
Asst. Administrator: W. A. Edwards	4852	4901
Asst. Administrator: W. E. Pothen	4852	4901
Asst. Administrator: H. L. Smith, Jr.	4858	8025
Office of Distribution		
Act. Dir.: H. W. Ketchum	4886-B	4461
Mrkt. Res. & Dev.: N. A. Miller	4887	4486
Mrkt. Operations: I. Q. Lord	4886	4192
Office of Technical Services		
Dir.: J. C. Green	4878	2143
Agri., Constr. & Mining Equip. Div.		
Deputy Dir.: J. F. Skillman	4111	4317
Automotive Div.		
Dir.: G. R. Davis	4100	3294
Bus. Machines & Office Equip. Div.		
Dir.: J. L. Oliver	4001-A	3518
Communications Div.		
Dir.: W. A. Vanstory	4029-A	4821
Electrical Equip. Div.		
Dir.: B. W. Clark	4114	2175
Electronics Division		
Deputy Dir.: D. S. Parris	4115	4036
Gen. Components Div.		
Dir.: C. Burrell	4126	3155
Gen. Ind. Equip. Div.		
Deputy Dir.: H. W. Mills	4007	4327
Metalworking Equip. Div.		
Dir.: R. Cross	4013	3525
Power Equip. Div.		
Dir.: D. Selden	4120	4241
Shipbldg., R.R., Ordn. & Aircraft Div.		
Acting Deputy Dir.: F. H. Winget	4029	4816

Want Extra Copies?

A limited number of extra copies of this special feature will be available upon request to Readers' Service Dept., The Iron Age, 100 E. 42nd St., New York 17, N. Y.



H-BOMB: Defense In Dispersion

Industrial centers helpless against hydrogen bomb attack . . . Decentralization a must wherever possible . . . ODM studies new incentives . . . Push stockpiling—*Staff Report.*

Two great explosions in the lonely Pacific Mar. 1 and 26 catapulted mankind from the atomic to the hydrogen age.

Atmospheric disturbances had scarcely run their course when Admiral Lewis L. Strauss, chairman of the U. S. Atomic Energy Commission, declared that the hydrogen bomb could be made as large as desired—"large enough to take out a city—any city."

Destroy Any City

What does it mean? What happens in case of war? Or worse still, in case of sudden attack? What might it mean in terms of life or property? What would it mean to public health, to water and food supply, to fire and police protection?

But wait a minute, this is A-bomb thinking. We are now in the age of the Hell bomb, the bomb that can destroy any city.

Now we are beginning to get it. The dawn of the hydrogen age means that no city can completely defend itself from destruction.

The H-bomb can be delivered by plane. And even the best aircraft defense, complete with radar and guided missiles, cannot hope to achieve total destruction of an invading air force. Nor can we expect it to prevent a bomb carrier from slipping through to wipe out its target.

And it wouldn't even take a direct hit to wipe out the target. In terms of destruction, here's what the H-bomb can do:

(1) Obliterate . . . 5 mile radius.

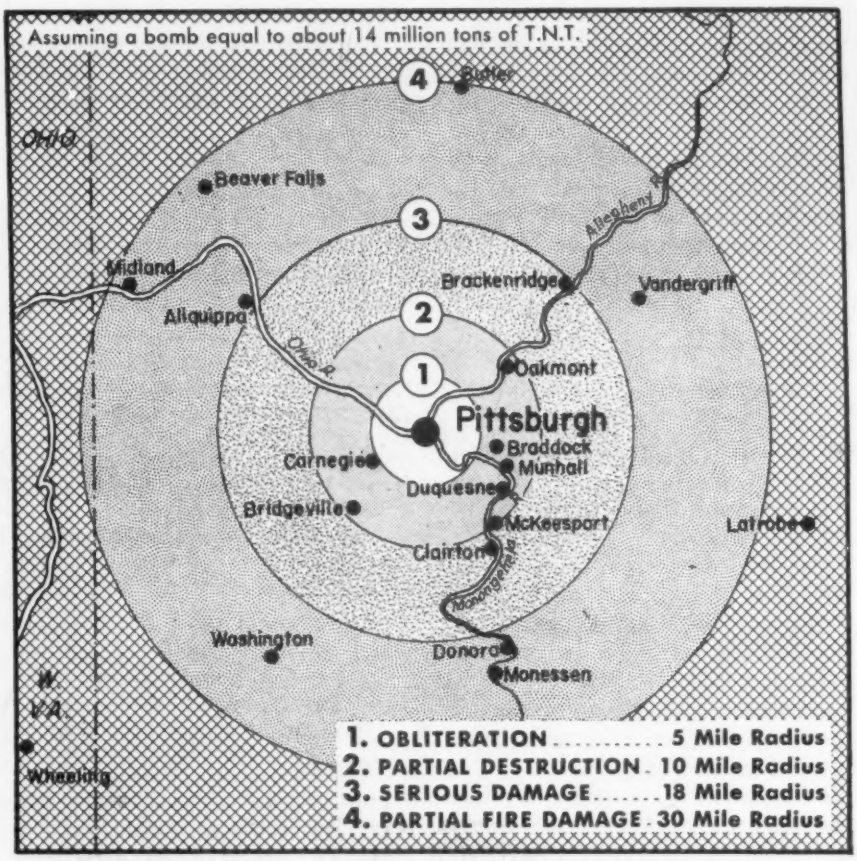
(2) Partial Destruction . . . 10 mile radius from target center.

(3) Serious Damage . . . 18 mile radius.

(4) Partial Fire Damage . . . 30 mile radius.

For a more vivid understanding of what this means, apply it to your city.

The IRON AGE chose two important steel producing centers, Pittsburgh and Chicago, which together account for nearly half of all steel production in the U. S. The accompanying maps indicate that one H-



DIRECT HIT on Golden Triangle would knock out major steel mills.

STEEL: Profits Rise 38 Pct In '53

Production, shipments, sales set new highs in '53 . . . But controls, taxes, labor costs, heightened competition held income 4 pct under 1950 record—By J. B. Delaney.

The steel industry shattered virtually every sales and production record in the book during 1953 but came off second best to 1950 in earnings.

The annual IRON AGE financial analysis indicates that 1953 earnings were more than 4 pct below 1950, although sales were approximately one-third greater. Three out of four reporting companies had better earnings in 1950.

Twenty-nine companies representing 93 pct of industry capacity were covered.

Competition Narrowed Margin

Factors that tended to limit net earnings in 1953 included price controls, which were not lifted until mid-March, heavy taxes, higher labor costs, and more competitive conditions beginning in fourth quarter. The tax burden was moderated somewhat by accelerated amortization on emergency facilities.

Competition forced the steel companies to (1) absorb freight charges, (2) trim extra charges, and (3) eliminate premium prices where they existed. A major producer estimates that freight absorption alone cost him an average of 72¢ per ton in fourth quarter. Industry-wide this would amount to approximately $13 million on basis of shipments during the period.

The competitive picture worsened during first quarter of 1954, but the industry had some bright spots to contemplate: (1) the excess profits tax expired last Dec. 31, (2) Washington is at least considering a change in the income tax law to base depreciation allowances on replacement rather than original cost, (3) the fight to eliminate double taxation of dividends looks more encouraging, and (4) business is expected to take a turn for the better some time in second quarter.

Last year was eventful from many angles and overshadowed 1952 by a large margin. The industry's 1952 performance was blighted by the 54-day steel strike. In fact, production and shipments in first three quarters of '53 reflected the strike's impact on consumer inventories.

But even compared with 1951, the previous record year on just about everything except earnings, the industry in 1953 established new marks in steel production (111.6 million tons); pig iron and ferroalloy production (76 million tons); steel shipments (80.2 million tons); and sales.

Companies covered by THE IRON AGE survey reported sales of $12.3 billion, compared with $10.1 billion in 1952, approximately $11.1 billion in 1951, and $9 billion in 1950. This indicates total sales volume for the industry last year was over $13 billion.

Federal income taxes set aside by the 29 companies in 1953 amounted to $933 million, an increase of 119 pct over 1952, but considerably less than 1951's tax bill of approximately $1.2 billion. Accelerated amortization on emergency facilities was the chief reason for the lower tax bill as compared with 1951. Tax allowances on facilities covered by certificates of necessity will rise to a peak during the next 2 years. Once they are written off, however, the tax burden on the steel producers will rise sharply. At least two companies—Pittsburgh Steel and Granite City—are building up a nest egg to help absorb the shock. But most producers prefer to cross the bridge when they come to it.

Net income per cent of sales last year was 14.3 pct better than in 1952, but 29 pct less than in 1950, and not as good as either 1951 or 1949. Net income was $690.9 million compared with $501.4 million in 1952, $638.4 million in 1951, and $720.9 million in 1950.

Common dividends declared were up 3.9 pct over 1952. Despite the strike in 1952 steel companies maintained a good record of dividend payments in that year to encourage potential investors. Despite this, many steel company stocks are selling well below book value.

The Top Twelve

Net income, in thousands of dollars, of 12 steel companies rated in order of reported 1953 profits, with pct of change from 1952 is as follows:

Company	1953	1952	Pct of Change
U. S. Steel Corp.	$222,087	$143,687	+ 54.6
Bethlehem Steel Corp.	133,947	90,900	+ 47.4
Republic Steel Corp.	56,743	44,274	+ 28.2
National Steel Corp.	50,334	37,559	+ 34.0
Armco Steel Corp.	33,902	31,337	+ 8.2
Inland Steel Co.	33,867	23,755	+ 42.6
Jones & Laughlin Steel Corp.	31,015	19,482	+ 59.2
Youngstown Sheet & Tube Co.	30,839	22,915	+ 34.6
Wheeling Steel Corp.	12,458	10,950	+ 13.8
Kaiser Steel Corp.	9,121	10,399	— 12.3
Colorado Fuel & Iron Corp.	8,031	5,761	+ 39.4
Allegheny Ludlum Steel Corp.	7,791	5,940	+ 31.2

THE IRON AGE Financial Analysis of

COMPANY	Year	Ingot Capacity Net Tons	Ingot Production Net Tons	Percent of Capacity Operated	Steel Shipments Net Tons	Net Sales and Operating Revenue	Provision for Federal Income Taxes	Net Income	Net Income Percent of Sales	Number of Common Shares Outstanding	Earnings Per Common Share
U. S. Steel Corp.	1953	36,399,000	35,827,000	98.4	25,091,000	3,861,034,728	323,000,000	222,087,840	5.8	26,109,756	7.54
	1952	34,642,000	29,436,000	85.0	21,133,000	3,137,397,336	117,000,000	143,687,746	4.6	26,109,756	4.54
Bethlehem Steel Corp.	1953	17,600,000	17,662,687	100.4	12,712,994	2,094,952,155	161,000,000	133,947,837	6.4	9,582,942	13.30
	1952	16,800,000	14,116,342	84.0	10,290,587	1,701,541,383	66,000,000	90,900,771	5.3	9,582,942	8.80
Republic Steel Corp.	1953	10,262,000	9,630,454	94.5	7,135,745	1,137,123,547	100,500,000	56,743,547	5.0	5,952,919	9.25
	1952	10,262,000	7,991,238	82.8	6,025,990	918,447,135	42,600,000	44,274,053	4.8	5,902,719	7.21
Jones & Laughlin Steel Corp.	1953	6,166,500	6,033,000	96.0	4,278,000	624,387,000	27,900,000	31,015,000	5.0	6,200,654	4.77
	1952	5,900,000	4,710,000	83.0	3,332,000	495,401,000	*5,858,000*[2]	19,482,000	3.9	6,200,654	2.91
National Steel Corp.	1953	5,650,000	.....	.....	.....	634,178,060	69,325,000	50,334,130[6]	7.9	7,362,045	6.84[4]
	1952	5,100,000	.....	.....	.....	548,625,817	42,000,000	37,559,477	6.9	7,362,045	5.10
Youngstown Sheet & Tube Co.	1953	4,947,500	5,091,876	102.9	3,675,229	554,059,088	27,900,000	30,839,716	5.6	3,350,016	9.21
	1952	4,370,000	3,937,490	90.1	2,867,500	439,623,183	16,890,000	22,915,822	5.3	3,350,016	6.84
Armco Steel Corp.	1953	4,718,000	4,704,773	99.7	3,375,630	588,919,900	50,788,608	33,902,462	5.8	5,214,988	6.50
	1952	4,525,000	4,042,473	89.3	3,078,639	518,575,218	43,095,226	31,337,861	6.0	5,214,994	6.01
Inland Steel Co.	1953	4,500,000	4,513,076	100.3	3,712,000	579,509,058	39,379,000	33,867,184	5.9	4,907,654	6.90
	1952	3,750,000	3,307,253	84.7	3,307,253	460,451,935	13,117,000	23,755,218	5.2	4,899,380	4.85
Colorado Fuel & Iron Corp.[9]	1953	2,311,785	2,130,451	92.2	1,948,414	248,835,574	14,572,400	8,031,224	3.2	2,478,084	3.09
	1952	2,024,000	1,892,485	93.5	1,575,987	195,757,164	8,461,500	5,761,965	2.9	2,158,084	2.64
Wheeling Steel Corp.	1953	1,860,000	1,797,419	96.6	.....	219,509,774	14,036,000	12,458,311	5.7	1,423,897	7.49
	1952	1,860,000	1,464,985	78.8	.....	180,285,277	7,475,000	10,950,780	6.1	1,423,897	6.43
Sharon Steel Corp.	1953	1,550,000	1,527,706	98.6	1,144,488	168,268,508	7,240,000	6,709,625	4.0	1,100,000	6.10
	1952	1,550,000	1,284,170	82.8	944,893	132,376,426	2,750,000	5,120,414	3.9	1,100,000	4.65
Kaiser Steel Corp.[9]	1953	1,536,000	1,458,904	100.1	951,897	134,500,041	9,700,000	9,121,284	6.8	3,200,000	2.12
	1952	1,380,000	1,381,862	100.1	941,108	117,925,049	9,900,000	10,399,306	8.8	3,200,000	2.52
Pittsburgh Steel Co.	1953	1,404,000	1,037,335	86.4	1,009,511	141,471,302	5,310,000[4]	4,648,195	3.3	1,281,208	2.61
	1952	1,152,000	971,029	85.3	958,829	130,158,219	4,437,000[3]	5,150,034	4.0	1,182,651	3.25
Crucible Steel Co. of America	1953	1,351,400	.....	.....	.....	232,276,349	6,896,979	5,109,802	2.2	687,180	5.28
	1952	1,350,700	.....	.....	.....	180,266,483	5,577,506	5,394,520	3.0	634,985	6.13
Barium Steel Corp.	1953	893,000	497,790	55.7	.....	89,719,175	3,849,840	2,321,140	2.6	2,299,859	1.01
	1952	893,000	690,128	77.3	.....	99,052,028	6,566,295	2,746,050	2.8	2,259,857	1.22
Allegheny Ludlum Steel Corp.	1953	864,200	680,619	78.8	537,341	242,091,546	11,670,000	7,791,287	3.2	1,689,358	4.40
	1952	889,200	569,921	64.1	467,838	190,091,165	2,900,000	5,940,324	3.1	1,656,233	3.37
Northwestern Steel & Wire Co.[10]	1953	825,000	361,550	43.8	336,056	44,291,906	485,000	303,163	.7	817,825	.37
	1952	573,000	313,856	83.9	276,023	34,028,721	645,000	1,830,601	5.4	817,825	2.24
Granite City Steel Co.	1953	720,000	937,801	130.3	805,455	87,856,006	6,953,500[5]	6,488,452	7.4	1,544,044[7]	3.77
	1952	720,000	621,574	86.3	698,767	74,587,639	3,917,000[5]	4,985,954	6.7	1,376,477[7]	3.17
Newport Steel Corp.[11]	1953	708,537	528,024	75.0	388,798	63,989,993	2,400,000	2,221,955	3.5	1,078,546	2.06
	1952	708,537	399,666	56.0	304,800	50,502,854	1,500,000	1,903,209	3.8	1,078,547	1.76
Lukens Steel Co.	1953	675,000	763,879	113.2	590,635	97,850,937	9,325,000	3,607,713	3.7	317,976	11.35
	1952	675,000	555,102	82.2	403,771	69,616,358	3,631,165	2,316,791	3.3	317,976	7.29
Detroit Steel Corp.	1953	660,000	529,044	80.2	583,421	93,391,509	6,612,624	5,230,259	5.6	2,419,017	2.16
	1952	660,000	529,432	80.2	609,437	87,421,483	4,673,235	4,276,666	4.9	2,371,586	1.80
Alan Wood Steel Co.	1953	625,000	598,334	95.7	442,537	59,756,645	2,457,000	3,213,690	5.4	624,812	4.63
	1952	625,000	658,449	105.4	473,983	60,479,849	2,475,000	2,251,073	3.7	606,377	3.17
Copperweld Steel Co.	1953	618,318	.....	.....	.....	83,803,418	3,120,000	2,852,078	3.4	515,188	5.05
	1952	618,318	.....	.....	.....	71,642,488	2,373,500	2,304,387	3.2	514,864	4.38
McLouth Steel Corp.	1953	579,700	528,734	91.2	.....	.....	11,560,000	5,241,501	.....	1,189,600	4.41
	1952	579,700	491,756	84.8	.....	.....	9,600,000	4,227,854	.....	951,680	4.44
Lone Star Steel Co.	1953	550,000	195,155	.....	124,849	27,284,256	338,600	2,113,568	7.8	2,640,000	.80
	1952	.....	.....	.....	.....	18,738,525	768,900	2,452,072	13.0	2,640,000	.93
Laclede Steel Co.	1953	440,000	427,514	97.2	362,040	50,834,319	4,975,000	2,703,805	5.3	206,250	13.11
	1952	410,000	413,292	100.8	355,630	47,545,026	2,764,000	2,132,746	4.5	206,250	10.34
Keystone Steel & Wire Co.	1953	425,000	356,969	84.0	268,799	44,554,153	4,861,627	4,149,946	9.3	1,875,000	2.21
	1952	425,000	389,762	91.7	312,068	48,939,590	6,116,648	4,073,232	8.3	1,875,000	2.17
Rotary Electric Steel Co.	1953	425,000	299,776	70.5	240,120	44,150,335	4,924,000	2,262,367	5.1	348,350	6.50
	1952	425,000	323,959	76.2	249,259	37,212,183	2,841,000	1,843,064	5.0	290,413	6.35
Continental Steel Corp.	1953	394,000	362,048	91.9	252,625	36,761,804	1,700,000	1,603,163	4.4	501,361[15]	3.20
	1952	394,000	325,138	82.5	244,169	35,716,970	1,880,000	1,477,030	4.1	501,361[15]	2.94
GRAND TOTAL	1953	109,658,940	104,200,000[21]	94.9[20]	74,600,000[21]	12,285,361,086	932,780,178	690,920,244	5.6	96,918,529	7.13
	1952	103,261,455	88,700,000[21]	85.8[20]	63,200,000[21]	10,082,375,504	426,078,975	501,451,020	4.9	95,786,569	5.24
Percent change 1953 over 1952		+6.2	+17.5	+10.6	+18.0	+22.0	+119.0	+37.8	+14.3	+1.2	+36.1

1. Payable after 1 yr.
2. Credit reflects $9,269,000 recovery 1951 EPT.
3. Corrected.
4. Includes $2,047,000 set aside for future income taxes.
5. Includes $4,094,000 in 1953 and $2,082,000 in 1952 set aside for future income taxes.
6. Before special charge arising from loss on disposal of Weirton Mine.
7. Excludes 7,843.07 shares in 1953 and 2,563.43 shares in 1952 represented by scrip certificates.
8. Adjusted for preferred sto. in treasury, 5640 shares, cost $511,122.
9. Fiscal year ended
10. Fiscal year ended
11. Fiscal year ended
12. Plus 2 pct sto. div

Financial Analysis of the Steel Industry, 1953-1

ision deral ome xes	Net Income	Net Income Percent of Sales	Number of Common Shares Outstanding	Earnings Per Common Share	Common Dividends Declared	Number of Preferred Shares Outstanding	Preferred Dividends Declared	Funded Debt[1]	Preferred Stock	Co S
),000	222,087,840	5.8	26,109,756	7.54	78,329,268	3,602,811	25,219,677	64,475,699	360,281,100	870,
),000	143,687,746	4.6	26,109,756	4.54	78,329,268	3,602,811	25,219,677	61,007,129	360,281,100	870,
),000	133,947,837	6.4	9,582,942	13.30	38,331,768	933,887	6,537,209	154,914,000	93,388,700	303
),000	90,900,771	5.3	9,582,942	8.80	38,331,768	933,887	6,537,209	298,314,000	93,388,700	303
),000	56,743,547	5.0	5,952,919	9.25	26,652,970	282,043	1,692,258	150,818,613	28,204,300	137
),000	44,274,053	4.8	5,902,719	7.21	23,586,812	282,043	1,692,258	165,681,945	28,204,300	136
),000	31,015,000	5.0	6,200,654	4.77	12,091,000	293,568	1,468,000	119,973,000	29,357,000	62
8,000[2]	19,482,000	3.9	6,200,654	2.91	11,161,000	293,568	1,468,000	144,652,000	29,357,000	62
5,000	50,334,130[6]	7.9	7,362,045	6.84[9]	23,862,229	None	None	55,000,000	None	73
),000	37,559,477	6.9	7,362,045	5.10	22,048,928	None	None	55,000,000	None	73
),000	30,839,716	5.6	3,350,016	9.21	12,562,560	None	None	100,000,000	None	105
),000	22,915,822	5.3	3,350,016	6.84	10,050,048	None	None	93,100,000	None	105
3,608	33,902,462	5.8	5,214,988	6.50	15,640,891	None	None	75,281,460	None	52
5,226	31,337,861	6.0	5,214,994	6.01	15,640,669	None	None	80,519,945	None	52
),000	33,867,184	5.9	4,907,654	6.90	17,176,789	None	None	111,146,500	None	62
7,000	23,755,218	5.2	4,899,380	4.85	14,698,140	None	None	113,996,500	None	62
2,400	8,031,224	3.2	2,478,084	3.09	3,476,791	239,516	383,074	60,500,000	12,043,396	12
1,500	5,761,965	2.9	2,158,084	2.64	3,118,518	46,941	54,438	48,500,000	2,375,967	10
5,000	12,458,311	5.7	1,423,897	7.49	4,271,691	357,526[5]	1,787,630	52,886,900	35,752,600[5]	37
5,000	10,950,780	6.1	1,423,897	6.43	4,271,177	357,526[5]	1,787,630	55,024,900	35,752,600[5]	37
),000	6,709,625	4.0	1,100,000	6.10	4,400,000	None	None	6,850,000	None	11
),000	5,120,414	3.9	1,100,000	4.65	4,400,000	None	None	7,850,000	None	11
),000	9,121,284	6.8	3,200,000	2.12	1,600,000	1,600,000	2,334,102	140,557,201	40,000,000	
),000	10,399,306	8.8	3,200,000	2.52	800,000	1,600,000	2,330,452	113,126,851	40,000,000	
),000[4]	4,648,195	3.3	1,281,208	2.61	8% stk. div.[23]	241,943	1,307,852	35,395,836	24,194,300	1
7,000[3]	5,150,034	4.0	1,182,651	3.25	8% stk. div.[23]	241,943	1,307,373	28,437,668	24,194,300	1
),979	5,109,802	2.2	687,180	5.28	8% stk. div.	294,367	1,471,835	36,396,000	29,436,700	1
7,506	5,394,520	3.0	634,985	6.13	10% stk. div.	298,406	1,492,030	41,637,000	29,840,600	1
),840	2,321,140	2.6	2,299,859	1.01	1,144,957	None	None	None	None	
6,295	2,746,050	2.8	2,259,857	1.22	1,123,108	None	None	None	None	
),000	7,791,287	3.2	1,689,358	4.40	3,312,466[12]	81,346	355,894	29,556,000	8,134,600	
),000	5,940,324	3.1	1,656,233	3.37	3,386,150[12]	81,346	355,894	30,860,000	8,134,600	1
5,000	303,163	.7	817,825	.37	None	None	None	2,989,650	None	
5,000	1,830,601	5.4	817,825	2.24	None	None	None	5,503,450	None	
3,500[5]	6,488,452	7.4	1,544,044[7]	3.77	3% stk. div.	121,359	667,520	33,613,125	12,135,900	1
7,000[5]	4,985,954	6.7	1,376,477[7]	3.17	1,471,005[13]	121,376	620,506	31,204,375[17]	12,137,600	1
),000	2,221,955	3.5	1,078,546	2.06	539,273	None	None	335,030	None	
),000	1,903,209	3.8	1,078,547	1.76	485,346	None	None	953,030	None	
5,000	3,667,713	3.7	317,976	11.35	953,928	None	None	4,418,000	None	
1,165	2,316,791	3.3	317,976	7.29	1,271,904	None	None	5,417,000	None	
2,624	5,230,259	5.6	2,419,017	2.16	1,778,690[12]	None	None	39,740,000	None	
3,235	4,276,666	4.9	2,371,586	1.80	2,371,586	None	None	23,925,876	None	
7,000	3,213,690	5.4	624,812	4.63	874,737	64,575	322,875	3,540,000	6,457,500	
5,000	2,251,073	3.7	606,377	3.17	848,928	65,250	326,250	4,357,000	6,525,000	
),000	2,852,078	3.4	515,188	5.05	1,030,270	86,738	251,289	5,827,335	4,336,900	
3,500	2,304,387	3.2	514,864	4.38	1,029,728	19,720	51,339	7,107,668	4,486,000	
),000	5,241,501	.....	1,189,600	4.41	None	None	None	64,000,000	None	
),000	4,227,854	.....	951,680	4.44	None	None	None	11,250,000	None	
8,600	2,113,568	7.8	2,640,000	.80	None	None	None	70,843,239	None	
8,900	2,452,072	13.0	2,640,000	.93	None	None	None	52,834,886	None	
5,000	2,703,805	5.3	206,250	13.11	1,072,500	None	None	3,510,198	None	
4,000	2,132,746	4.5	206,250	10.34	928,125	None	None	1,758,546	None	
1,627	4,149,946	9.3	1,875,000	2.21	3,000,000	None	None	None	None	
6,648	4,073,232	8.3	1,875,000	2.17	3,000,000	None	None	None	None	
4,000	2,262,367	5.1	348,350	6.50	876,335[22]	None	None	3,698,000	None	
1,000	1,843,064	5.0	290,413	6.35	871,239	None	None	1,000,000	None	
0,000	1,603,163	4.4	501,361[15]	3.20	701,905	None	None	2,800,000	None	
0,000	1,477,030	4.1	501,361[15]	2.94	852,314	None	None	3,000,000	None	
0,178	690,920,244	5.6	96,918,529	7.13	253,681,018	8,199,679	43,799,215	1,429,065,786	683,722,996	1,8
8,975	501,451,020	4.9	95,786,569	5.24	244,075,761	7,944,817	43,243,056	1,486,019,769	674,677,767	1,8
9.0	+37.8	+14.3	+1.2	+36.1	+3.9	+3.2	+1.3	−3.8	+1.3	n

3.07 shares in 1953 and 2,563.43 shares in ited by scrip certificates.
preferred sto. in treasury, 5640 shares, cost

9. Fiscal year ended June 30.
10. Fiscal year ended July 31.
11. Fiscal year ended Oct. 31.
12. Plus 2 pct sto. div.
13. Plus 3 pct sto. div.
14. Excluding long-term debt due within 1 yr.
15. Less treasury stock.
16. Includes long-term debt. Figures as of Dec. 31 before transfer
17. Revised.
18. Includes
19. Negative

DATA COVER OPERATIONS OF 29 COMPANIES REPRESENTING 93 PCT OF THE INGOT CAPACITY OF THE UNITED STATES AS OF JAN. 1, 1953

d	Common Stock	Surplus	Invested Capital	Working Capital	Net Income Percent of Investment	Year	COMPANY
00	870,325,200	1,024,050,240	2,319,132,239	346,019,785	9.7	1953	U. S. Steel Corp.
00	870,325,200	905,511,345	2,197,124,774	326,555,376	6.6	1952	
00	303,459,830	611,874,056	1,163,636,586	401,652,750	12.4	1953	Bethlehem Steel Corp.
00	303,459,830	522,795,196	1,217,957,726	499,680,723	8.1	1952	
00	137,024,601	304,830,721	620,878,235[14]	192,310,631	10.0	1953	Republic Steel Corp.
00	136,060,726	276,432,402	606,379,373[14]	155,190,100	8.0	1952	
00	62,007,000	281,036,000	492,373,000	102,687,000	7.4	1953	Jones & Laughlin Steel Corp.
00	62,007,000	263,580,000	499,596,000	93,461,000	4.7	1952	
	73,620,450	290,902,920	418,230,307[15]	135,654,425	12.5	1953	National Steel Corp.
	73,620,450	256,876,254	385,035,319[15]	145,121,069	10.1	1952	
	105,088,053	219,905,076	424,993,129	159,364,161	8.3	1953	Youngstown Sheet & Tube Co.
	105,088,053	201,627,920	399,815,973	170,787,553	6.6	1952	
	52,149,886	261,499,900	388,931,246	134,103,527	9.4	1953	Armco Steel Corp.
	52,149,936	243,238,329	375,908,210	123,973,720	9.0	1952	
	62,852,323	186,898,489	344,188,324[16]	144,462,449	10.9	1953	Inland Steel Co.
	62,502,746	170,189,501	337,631,507[16]	148,395,528	8.0	1952	
96	12,391,021	78,524,612	166,459,029	56,849,970	6.3	1953	Colorado Fuel & Iron Corp.[9]
67	10,791,021	70,571,067	133,738,055	31,514,332	5.8	1952	
00[8]	37,021,322	80,307,655[8]	205,968,477	64,318,211	7.0	1953	Wheeling Steel Corp.
00[8]	37,021,322	73,908,665[8]	201,707,487	76,312,048	6.4	1952	
e	11,060,390	51,416,075	69,326,465	36,344,534	10.1	1953	Sharon Steel Corp.
e	11,060,390	49,106,450	68,016,840	35,916,807	7.9	1952	
00	3,200,000	57,090,413	240,847,614	44,876,305	6.0	1953	Kaiser Steel Corp.[9]
00	3,200,000	51,903,231	208,125,843	33,966,961	6.7	1952	
00	12,847,236	42,088,506	114,525,878	20,849,778	4.9	1953	Pittsburgh Steel Co.
00	11,017,188	40,554,038	104,203,194	27,402,011	5.6	1952	
00	17,179,514	39,308,032	122,320,246	39,138,599	5.4	1953	Crucible Steel Co. of America
00	15,874,644	36,897,933	124,250,177	38,480,807	5.4	1952	
e	2,299,859	18,797,158	21,097,017	6,884,038	11.0	1953	Barium Steel Corp.
e	2,259,857	17,328,858	19,588,715	6,731,218	14.0	1952	
00	1,689,358	69,738,022	79,561,980	34,601,191	9.8	1953	Allegheny Ludlum Steel Corp.
00	11,245,174	56,059,279	75,439,053	34,137,050	7.9	1952	
e	4,089,125	11,749,755	15,838,880	*3,676,693*[19]	1.9	1953	Northwestern Steel & Wire Co.[10]
e	4,089,125	11,446,592	15,535,717	*1,728,717*[19]	11.8	1952	
00	19,398,588	25,730,502	90,878,115	13,395,407	9.1	1953	Granite City Steel Co.
00	17,238,068	22,068,390	82,648,433[17]	18,324,121[17]	7.1[17]	1952	
e	1,078,546	20,505,192	21,583,738	10,023,833	10.3	1953	Newport Steel Corp.[11]
e	1,078,547	20,238,310	21,316,857	9,612,116	8.9	1952	
e	3,179,760	23,078,198	30,675,958	12,076,943	13.0	1953	Lukens Steel Co.
e	3,179,760	21,040,651	29,637,411	14,014,894	7.8	1952	
e	2,419,017	36,663,940	39,082,957	11,335,488	17.6	1953	Detroit Steel Corp.
e	2,371,586	33,259,801	35,631,387	6,751,000	14.4	1952	
00	6,248,120	15,316,232	31,561,852	8,363,703	10.2	1953	Alan Wood Steel Co.
00	6,063,770	13,176,896	30,122,666	7,195,560	7.5	1952	
00	2,575,940	17,310,920	24,223,760	12,818,728	13.2	1953	Copperweld Steel Co.
00	2,574,320	15,735,893	22,796,213	13,971,993	10.4	1952	
ne	2,974,000	27,053,396	94,027,396[18]	11,111,490	6.9	1953	McLouth Steel Corp.
ne	2,379,200	22,406,696	36,035,896[18]	13,484,583	13.1	1952	
ne	2,640,000	20,101,361	84,294,641	8,078,069	6.1	1953	Lone Star Steel Co.
ne	2,640,000	17,987,792	60,954,988	8,723,533	6.9	1952	
ne	4,125,000	13,101,082	20,736,280	10,516,128	13.5	1953	Laclede Steel Co.
ne	4,125,000	11,469,777	17,353,323	7,631,733	12.7	1952	
ne	2,604,167	20,559,331	23,163,498	8,580,944	17.9	1953	Keystone Steel & Wire Co.
ne	2,604,167	19,409,386	22,013,553	7,460,469	18.5	1952	
ne	3,483,500	11,293,451	18,474,951	5,831,691	13.0	1953	Rotary Electric Steel Co.
ne	2,904,130	10,486,788	14,390,918	4,444,668	13.2	1952	
ne	7,018,789[15]	10,993,620	20,812,409	8,199,653	8.3	1953	Continental Steel Corp.
ne	7,018,789[15]	10,092,362	20,111,151	8,806,739	7.5	1952	
996	1,826,050,595	3,871,724,855	7,707,824,207	2,036,772,738	9.0	1953	GRAND TOTAL
767	1,825,949,999	3,465,399,802	7,363,066,759	2,066,318,995	6.8	1952	
.3	no change	+11.7	+4.7	−1.4	+32.4		Percent change 1953 over 1952

transfer of retained earnings to surplus.
17. Revised.
18. Includes funded debt.
19. Negative.
20. National rate for industry by AISI.
21. Estimated, based on national operating rate.
22. Plus 20 pct stock.
23. Actually, 2% quarterly.

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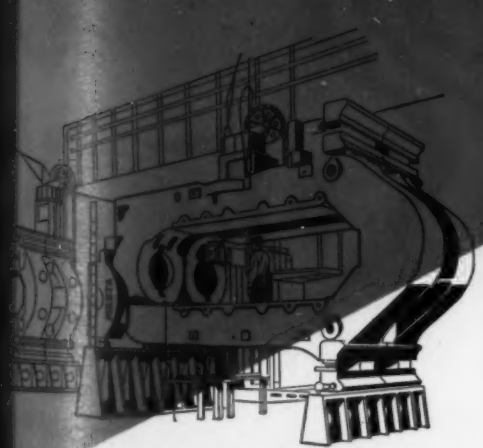
MESTA

HIGH-SPEED COLD MILLS

MESTA 56" FOUR-HIGH, FIVE-STAND HIGH-SPEED TANDEM COLD MILL INSTALLED IN A LARGE EASTERN STEEL PLANT.



SIMULTANEOUSLY MACHINING ROLLING MILL HOUSINGS IN PAIRS ON MESTA HEAVY DUTY DRAW-CUT SHAPERS

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

Rough Going In Truck Sales Race

Manufacturers enter third year of intense competition . . . Woo buyers market with new engines, styling, extras . . . Light truck sales off 20 pct—By *R. D. Raddant.*

On the workhorse side of the auto industry, truck manufacturers are locked in a competitive struggle that is as tough or tougher than the passenger car side.

In fact, because they have been in the competitive market more than a year longer than the peddlers of comfort, speed and glamour, they can teach the passenger salesmen a few things about competition.

"I have to laugh when the heads of the passenger car divisions complain about the return of competition," the general manager of a truck division remarked at the start of this new model year. "We have been in it since 1952."

Show New Features . . . For this reason, truck manufacturers went into the 1954 selling year with more new developments than ever in history. In new models, new engines, styling features and extras, the truck side probably introduced even more new selling points than did the passenger car manufacturers.

There were actually well over 20 completely new truck models introduced this year. At least four of the biggest makers had new engines to offer. The use of automatic transmissions spread throughout the lighter models into the medium and heavier field and even into the diesel powered range.

Power steering was made standard on at least one line and offered on many others. Every manufacturer without exception paid more attention to truck styling and eye appeal than ever before. Some prices were cut.

Sales Slip . . . And, like the passenger car field, the truck field is topped by a life-and-death struggle for supremacy between Chevrolet and Ford with the others trying to improve their market positions relatively.

In spite of the new sales inducements, the truck salesmen are finding it tough going. The early months of the year found sales of light trucks down as much as 20 pct, mediums down 11 pct, and heavy duty models down about 1 pct.

Through Mar. 27 of this year, truck production stood at 270,391 compared with 332,109 a year ago, slightly less than a 20 pct cut in output. Furthermore, the total for 1953 was substantially under 1952, indicating that the gradual slump in truck sales is of more than 2 years duration.

Drought Hurts Sales . . . Truck sales slump areas can be located generally in a circle drawn around the agricultural Midwest with the critical points located in the drought-stricken areas. General slump in farm income and tightening of the economy are major factors contributing to truck market conditions.

"We're really stressing that rule since our recent fire."

Truck Production Trends

	1954 Through Mar. 27	1953 Through Mar. 28	1953 Pct of Total Market
Chevrolet	88,133	110,245	29.9
Ford	81,379	57,846	26.2
International	26,275	34,588	10.0
GMC	22,877	35,623	9.5
Dodge	22,769	31,492	8.7
Willys	14,444	27,152	7.3
Others	14,514	35,163	10.6
Total	270,391	332,109	

Source: Automotive News

Individually, the companies went into 1954 with their best advances in years. Ford, trying to catch Chevrolet in truck as well as car sales, brought out a complete line of five new truck engines. For the first time Ford is producing factory-built tandems. This move into the tandem axle field was prompted by research that a 40 pct increase in this market is anticipated.

Power steering, offered last year on only one light truck series, was extended throughout other lines. Fordomatic transmissions were offered on several other series in addition to the lightest.

Dodge Gets Stronger . . . Chevrolet sharpened up its truck lines considerably and offered Power Glide or Hydra-Matic transmissions throughout.

Dodge introduced three new V-8 engines to its truck lines and brought out nine completely new models. In addition, Dodge Truck has gained considerable autonomy under Chrysler Corp. decentralizing. It has its own sales organization and Dodge trucks may now be sold by DeSoto or Chrysler dealers in one of a series of moves

to strengthen its position in the truck market.

GMC Truck & Coach made the most progress in the heavy truck field with an 8-speed automatic transmission and a 21-speed Twin Hydra-Matic transmission for diesel trucks. GMC pioneered the use of automatic transmissions in 1951 and has now extended them through medium and heavy duty trucks and tractors. GMC also restyled cabs in line with the appearance improvement trend.

Studebaker also introduced V-8 engines to its truck line, a move that reportedly helped triple truck sales with the new models.

Throughout the industry, cabs were shortened and close coupling improved to meet size restrictions. All new developments can't be listed in these few columns, but it gives an idea of what truckmakers are up against and how they are meeting the competitive market.

Budd Options Murray . . . An option to lease or buy Murray Corp. autobody building facilities by Budd Co. kept the merger mill working extra hours in Detroit last week.

It ties in with Budd maneuvering to widen its auto body building program, possibly with the end view of becoming the body building division of the new American Motors Co. Budd now supplies Studebaker bodies while the Murray facilities are ideally located to make bodies for Packard, which is still looking for a corporate union, or Hudson.

Body Output Off . . . It also spotlights Murray problems with its auto body facilities where employment has dwindled from 5000 a year ago to 1000 today. Murray lost Ford business in 1951, but gained Willys and Hudson Jet body programs. The Jet program may end this year and Willys will make its own bodies. More recently, Murray started to tool up for Ford's Thunderbird sports car.

Monopoly:

Ford, GM may face FTC probe of alleged "unfair practices"

What has apparently been a routine study of dealer franchising and other auto industry practices by Federal Trade Commission and Justice Dept. may soon turn into a full-scale, 2-pronged probe of possible monopoly.

The resolution (HJR 484) introduced last week by Rep. Crumpacker, R., Ind., directs FTC to investigate "competitive trade practices" of the industry. Apparently the main targets of the proposed investigation are General Motors Corp. and Ford Motor Co.

Officers of both companies involved in Rep. Crumpacker's charge promptly issued statements in their own defense.

Harlow H. Curtice, GM president, put his side of the issue this way:

"As far as General Motors is concerned there is no production war in the automobile industry. As in the past, our schedules within the limit of our capacity have been established in relation to our own market appraisals. . . . Production of GM products currently reflects the demand from our customers."

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
Apr. 3, 1954..	119,778*	23,521*
Mar. 27, 1954..	125,317	24,245
Apr. 4, 1953..	138,648	31,919
Mar. 28, 1953..	147,156	34,533

*Estimated. Source: *Ward's Reports*

The Public's Choice

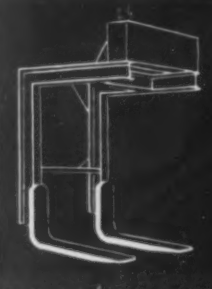
Ernest R. Breech, executive vice-president of Ford, voiced a parallel defense:

"Ford Motor Co. builds its cars and trucks according to orders from its dealers and bases its production schedules on those orders. . . . Our sales today reflect the operation of our free competitive system which is based on the freedom of choice of the public."

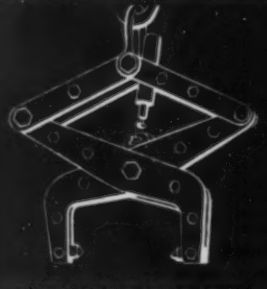
THE BULL OF THE WOODS — By J. R. Williams

Give productivity a lift! ...wherever there's a lifting job

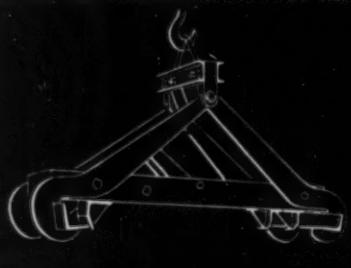
HEPPENSTALL AUTOMATIC TONGS
MAKE CRANE OPERATIONS...
SAFER · MORE EFFICIENT · MORE ECONOMICAL



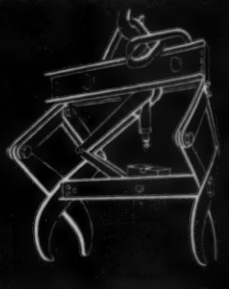
"C" hook for lifting pallets



Tong for stripping an ingot



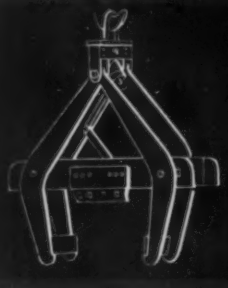
Tongs for lifting scrap boxes



Spreader type tongs for lift

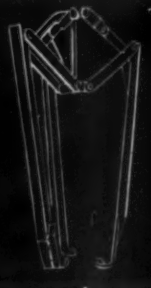
"C" hook for plate or flat objects

Ingot mould tong



Tongs for lifting groups of rounds

Tongs for lifting multiple co



From the melt shop . . . through the mill . . . to the shipping platform or yard . . . Heppenstall Automatic Tongs are handling hundreds of shapes, sizes, and weights.

There's no limit to the application of Heppenstall Tongs. They are designed for your *specific job*. They are specially built to handle whatever sizes, shapes and weights are involved in *your* materials handling requirements.

Heppenstall Tongs are provided with points, metal shoes, rubber, brake lining, or expanded metal to assure safe, dependable gripping. They have been designed to handle two or more units at once—or perform double operations, such as turning an object from the horizontal to the vertical (and vice versa) while lifting it.

Let us suggest ways for saving you time and money with Heppenstall equipment. Our engineering staff will be pleased to work with you . . . they would like to place at your disposal their experience and information in solving hundreds of materials handling problems.

Write to Heppenstall Company, 4620 Hatfield Street, Pittsburgh 1, Pa.

HEPPENSTALL

TONGS FOR EVERY LIFTING PROBLEM

Trimmed Taxes Turn Trade Trends Up

Early returns indicate excise tax cuts are boosting retail buying . . . Pass most savings on to consumer . . . Bring total tax reductions to $7.4 billion this year—By G. H. Baker.

On the basis of early returns from retailers, the tax cuts that became effective last week are promoting the hoped-for stimulation of trade. Consumer buying is definitely on the upgrade.

Savings resulting from lower excises are in most cases being passed on to the consumer. Taxes on household appliances, sporting goods, and light bulbs are collected at the manufacturing level, and there is no compulsion that the cut be passed on to the consumer. But in nearly all cases the consumer is getting the break. Internal Revenue Service has issued new rules telling distributors how to obtain refunds on the old tax paid on articles in stock.

Cut $7.4 Billion . . . President Eisenhower pointed out last week that the new $999 million in excise reductions help make up what he calls the greatest single tax reduction in dollars ever accomplished by the Federal Government in 1 year.

Including the Jan. 1 income tax reduction, the cuts total about $7.4 billion. This is $7.4 billion in potential purchasing power in the hands of the buying public. If the Administration's economists have figured public buying psychology correctly, the surge of increased buying that's just getting under way should sweep sales figures for consumer goods on to a high point just under the alltime record set last year.

Boost Draft Calls . . . Upcoming sharp rise (25 pct) in the military draft rate is to have a noticeable effect upon company hiring rates where apprentice workers are concerned. Draft calls have been running light (about 18,000 men monthly) for the past 12 months. Starting July 1, Army will jump the draft rate to a minimum of 25,000 men per month. Army Secretary Stevens plans to call up 420,000 men during the 12-month period starting July 1.

Paradoxically, the heavier draft demands arrive at a time when the Army is engaged in reducing its total manpower strength. Manpower losses resulting from men completing their 2-year draft hitches exceed this reduction in strength. The Army plans to cut by about 250,000 men during the coming fiscal year.

The draft is here to stay indefinitely. Secretary Stevens says as long as Army strength is to remain in excess of 600,000 men, selective service will have to remain in effect.

What New Excise Rates Are

President Eisenhower last week signed legislation which, in general, reduces to a flat 10 pct rate those excises which had been above that figure. An exception includes firearms and ammunition, which remain at 11 pct.

Former 10 pct rate on refrigerators, freezing, and similar equipment was cut from 10 to 5 pct, along with electric, gas, and oil appliances, also reduced to 5 pct.

No change was made in the 10 pct rate on air conditioners. Rate on lubricating oil was retained at 6¢ a gallon but in the case of cutting oils, the total tax is not to exceed 10 pct of the selling price.

Reduction in the rates on automotive vehicles, parts and accessories which were to have become effective on Apr. 1 were postponed until Apr. 1, 1955.

Urge Rebuilt Writeoffs . . . Senate taxwriters lend a sympathetic ear to proposals for accelerated amortization on rebuilt machinery. Final decision as to whether or not to permit fast writeoffs on used equipment still is weeks away.

But at least several Finance Committee members are convinced that the used machinery trade makes an excellent case for quick writeoffs, citing the relatively small amount of federal revenue involved and the fact that extra buying of rebuilt equipment would be stimulated as a result of the replacement incentive. The revenue revision bill now pending before the Senate permits fast writeoff of new equipment, but makes no provision for rebuilt equipment.

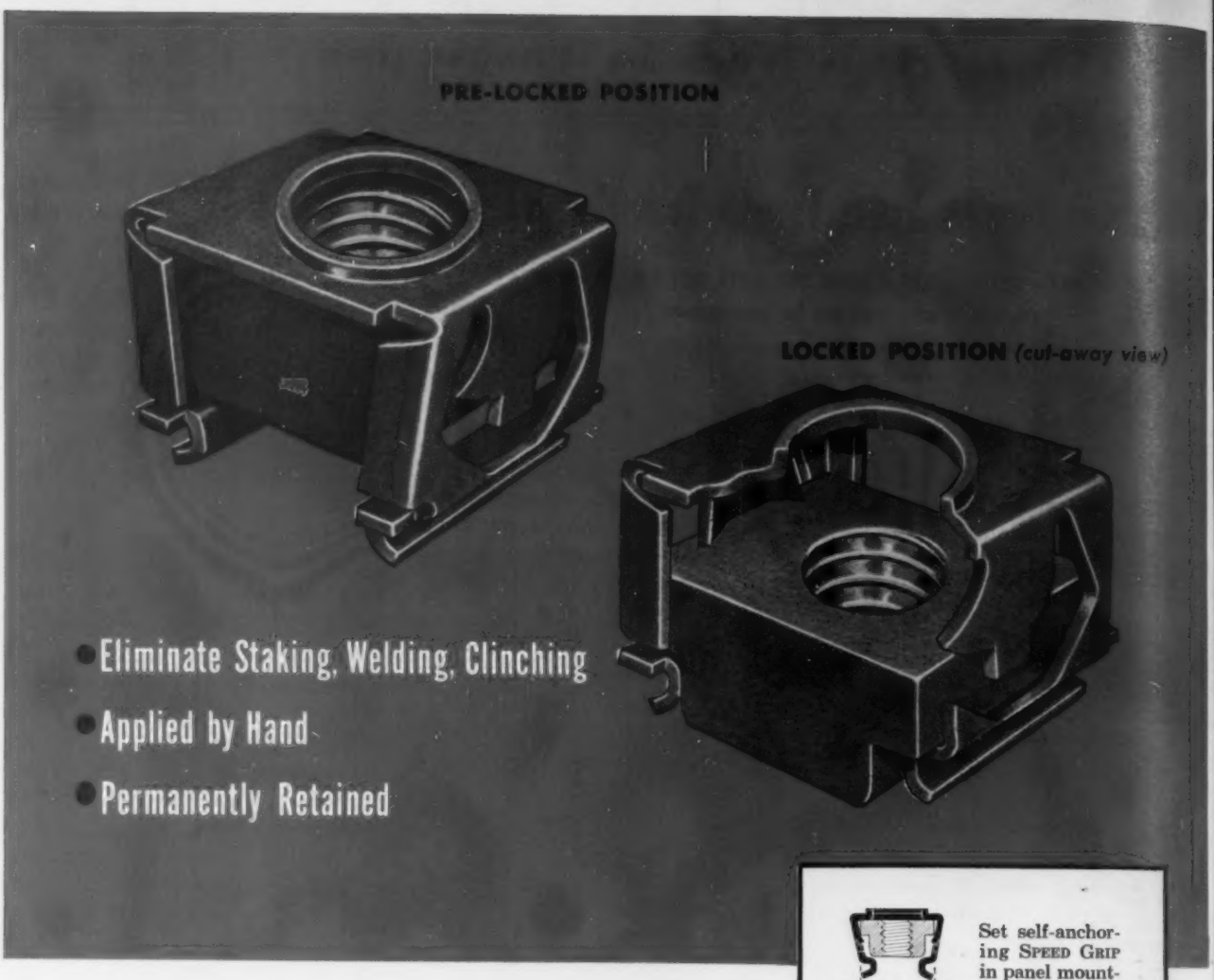
Strike Rate Dips . . . Strike activity continued to decline during February with the number of new strikes, workers involved, and total strike idleness at low levels.

Some 200 strikes began during the month, none involving as many as 10,000 workers, U. S. Bureau of Labor Statistics reports. But 150 stoppages were continued over from January, putting the total in effect at 350 with 100,000 workers on strike.

Name Steel Head . . . William Kerber, top-ranking executive of National Steel Corp., has been named director of the Iron & Steel Div., Business & Defense Services Administration, U. S. Commerce Dept.

Mr. Kerber succeeds Kenneth J. Burns, manager of sales, Sheet & Strip Div., Inland Steel Co. Neither Mr. Kerber nor Mr. Burns draws any salary from the government.

Mr. Kerber, 58, is a native of Sandusky, Ohio. He attended



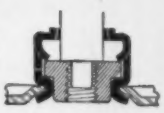
New, Self-Anchoring SPEED GRIP®
cuts assembly costs in half!

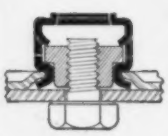
Whatever your present method of attaching square nuts to panels, new self-anchoring SPEED GRIPS can do the job faster, easier, better. This unique fastener has spring steel "mechanical hands" that permanently lock the nut in bolt-receiving position. It cannot be dislodged even with rough handling. Applied after painting or porcelainizing, there is no clogging, retapping or masking of threads to bother about. *And* it is ideal for blind location attachments.

Total up the savings in application time—in expensive assembly equipment—in handling time—in assembly steps—and you'll switch to self-anchoring SPEED GRIPS—the newest addition to the complete Tinnerman line of Nut Retainers.

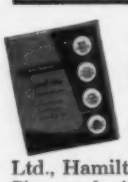
Set self-anchoring SPEED GRIP in panel mounting hole.

Simple tool presses nut into locked position.





Heavy duty nut in locked position — permanently retained — can't rotate, rattle or be dislodged.



Write today for free copy of new detailed SPEED GRIP Bulletin, No. 335. Tinnerman Products, Inc., Dept. 12, Box 6688, Cleveland 1, Ohio. *In Canada:* Dominion Fasteners Ltd., Hamilton, Ontario. *In Great Britain:* Simmonds Aerocessories, Ltd., Treforest, Wales. *In France:* Aerocessoires Simmonds, S.A., 7 rue Henri Barbusse, Levallois (Seine).

Kenyon College and Stevens Institute of Technology, was graduated from Ohio State University.

He has been associated with National Steel since the corporation was established in 1929. Previously he was associated with Witherow Steel Co. in Pittsburgh, and with M. A. Hanna Co.

Mr. Kerber served the War Production Board Steel Div. from 1941 through April 1945, and was head of Office of Price Stabilization's metals and minerals branch in 1951 and 1952.

D & B to ODM . . . Edwin B. George, economic director for Dun & Bradstreet, Inc., will head up an advisory committee to advise Office of Defense Mobilization on all aspects of the defense mobilization effort.

He will be assisted by Richard F. Sentner, assistant executive vice-president of U. S. Steel Corp., who will serve as vice chairman.

Officials of varied colleges, business and industrial firms, and public utilities and communications industries will serve as members of the committee.

Optimistic on Delaware Dredging

Congressmen from states bordering the Delaware River are optimistic about chances of getting an $8.4 million federal appropriation for dredging the river channel to a 40-ft depth.

Provision for the necessary funds may be made in an amendment to the Army's civil functions money bill, which passed the House in mid-March and is now before the Senate.

Rep. Hugh Scott, R., Pa., says the Corps of Engineers, which would have to do the work, considers the Delaware channel the "No. 1 priority project" awaiting a congressional appropriation. Mr. Scott recently met with other congressmen, Deputy Budget Director Rowland R. Hughes, and representatives of the Engineers to discuss the possibility of obtaining funds for dredging.

Mr. Hughes did not immediately give the Budget Bureau position.

Exports:

May now ship more goods in Western Hemisphere.

More than 100 commodities have been added to the list of goods which may be shipped to Western Hemisphere countries without individual export licenses.

In another action, U. S. Bureau of Foreign Commerce has substantially increased the dollar limits for shipments of more than 60 items of machinery to countries outside the western world.

New dollar limits apply to a variety of heavy machinery such as most machine tools, rolling mill equipment, road scrapers and graders, heavy jacks, foundry equipment, and others.

Kill Scrap Controls

Items which can be shipped under a general license include a variety of steel mill products, metal manufactures, lead, zinc and antimony ores and concentrates.

All export controls over iron and steel scrap except a nominal supervision for national security have also been thrown out.

Chief effect of the action is to eliminate the submission of availability in connection with license applications and to extend license validity period from the previous 60 days to 6 months.

Exporters are still required to have orders from foreign buyers and on exports to countries outside the Western Hemisphere must attach either an import certificate from such countries or a consignee and use statement.

"That's the first dollar I ever made . . . after taxes, of course."

Under the open end policy, only 196,000 tons of steel scrap were licensed for export during the first quarter, about 85,000 tons less than during fourth quarter 1953.

Rehab, Logis, Vulner

These words—or segments of words—are now a part of Washington's vocabulary of gobbledygook. They are the official short handles for "rehabilitation, logistics, and vulnerability."

They are used by the Office of Defense Mobilization to designate the jobs of three "specialists" who work with industry and with other government agencies in planning defense measures against enemy attack. The "rehab man," says ODM executive John D. Young, advises industry how to get back on its feet fast after being hit by enemy action.

Predict 7.6 Pct Shipping Drop

Railroads may expect to haul 16 pct less iron and steel during the second quarter than a year ago if regional shipping advisory boards are correct in their joint estimate.

All shipping may be expected to be down by an average of 7.6 pct, or about 590,000 carloads below second quarter 1953.

Coal and coke shipments are expected to drop 185,000 carloads below last year and ore and concentrates by 165,000.

On the other hand, roads may expect new business from cement, frozen foods, fresh fruit and vegetable, and cotton shippers.

Search Philippines for Minerals

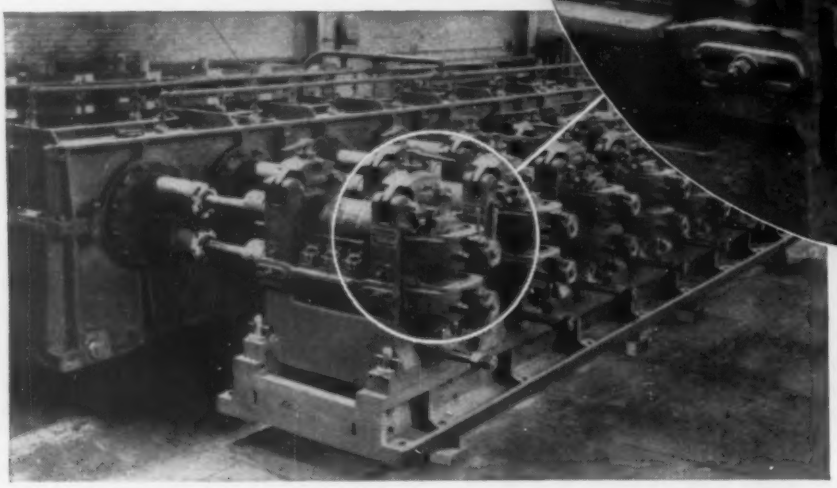
An aerial search for new mineral fields will shortly begin in the Philippines, financed largely by the U. S.

A contract has been awarded a British firm on the basis of competitive bidding at an estimated cost of about $125,000. Foreign Operations Administration assumes $101,000 of this.

Iron ore is the basic object.

ROLLER-BEARING END ROLL

Reduces Downtime



Steps Up Production

**End roll adjustment patent applied for.*

● The greatest improvement in end roll mechanism made in years . . . permits more accurate and faster end roll adjustment; more flexible operation and minimum maintenance.

The roller bearing is locked to the end of the roll, but may be changed in a jiffy—need not be removed for dressing or until the roll is scrapped. When rolls need changing, patented tilting caps swing up and rolls are raised through top of housing without disassembling end roll adjustment.*

Heavy C clamps secure the bearing housing to the frame with self-aligning surface contact for easy vertical adjustment without wear of clamping surface.

This advanced design typifies the Skill and experience of Birdsboro engineers. We'll be glad to apply our engineering service to your mill machinery problems anytime you say the word.

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Hydraulic Presses • Special Machinery • Steel Castings

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Inventory Adjustment Nears End

Lag in steel orders began earlier in the West than in rest of U. S., is now about over . . . Bethlehem reports orders increasing . . . Warehouse pickup—*By T. M. Rohan.*

Western steel industry appears to have nearly completed its inventory adjustment.

H. H. Fuller, Bethlehem Pacific president, told THE IRON AGE orders for his firm have increased every month since October, and March shipments were the highest since then.

U. S. Steel was tightening its belt with final retirement of the hand mill for hot-rolled sheets at its Torrance, Calif., mill. Two of this mill's four openhearths will also be brought back into operation at mid-month following completion of relining and installation of new charging buggies.

Pipe Orders . . . Kaiser Steel operations were at a high rate due principally to a large pipeline order for about 40,000 tons. Pipe being turned out is for Interprovincial Pipeline Co. of Canada which wants to double the existing line at various spots between Winnipeg and Edmonton. Kaiser tinplate production has also increased.

Mr. Fuller said increased sales for Bethlehem Pacific were due to the fact that western consumer inventories and lead time have to be considerably greater than for midwestern and eastern firms. Longer transportation time and greater percentage of out-of-area steel made the lag in ordering hit the West about 3 months before the rest of the country. Readjustment to normal levels and resumption of ordering is consequently beginning sooner than elsewhere.

Show Off Plant . . . Bethlehem Pacific last week showed off its Los Angeles plant to the press on completion of a more than $8 million modernization program started in 1946 which has almost quadrupled capacity.

Three electric furnaces have been installed replacing openhearths; a high speed rod and bar mill has been installed; and a billet mill was rebuilt and the area's first wire mill put in operation.

U. S. Steel's Torrance hand mill which was recalled to service during the Korean war "has about reached the limits of economic feasibility," company officials say. Bulk of the output of hot-rolled sheets formerly went to Boyle Mfg. Div., a neighboring U. S. Steel subsidiary producing barrels and drums.

Sheets are now expected to be brought in from mills in other areas since the Geneva Works has traditionally not rolled barrel stock. Some tonnage in cold-rolled sheets may also be utilized. Attempts will be made to absorb the 400 hand mill employees in the firm's other operations.

"Have you ever tried to learn Gregg shorthand, Miss Sparkling Brook?"

Warehouses Improve . . . Western warehouses last week were also showing slight business improvement. Several reported customers have sold off excess inventories they couldn't absorb.

"Inventory whittling by customers is now about done," one warehouseman said last week. "But most customers have lots of trouble saleswise, expenses are heavy and finances low, so we don't expect any sensational increase at our level but it's getting back to normal.

"Overtime is out. Most customers are quoting heavily, the bidding is hot and prices low but volume is still coming through. We feel our prices are still fairly good compared to other parts of the country."

Gets Big Sheet . . . Douglas Aircraft Co. at Long Beach, Calif., last week was learning new lessons in aluminum work. A 47-ft x 44-in. section of heat-treated, tapered flat sheet weighing 560 lb was received from Aluminum Co. of America. The huge sheet was rolled at Alcoa's Davenport, Ia., mill and finished at the Lafayette, Ind., extrusion mill.

Thickness runs from 0.151 to 0.269 in. and 12 will be used per wing in Douglas aircraft as skins and part of the basic structure.

Stiffer Competition . . . Eastern and Midwest firms are stepping up programs for local production facilities in the West.

This was reflected in a statement last week by G. L. Fox, general manager of the San Francisco Chamber of Commerce: "We are at present on the crest of the greatest wave of industrial commitments in San Francisco since 1945 and the area as a whole is enjoying record activity.

"Industrial commitments early this year were 91.8 pct greater than the same period last year and 182.2 pct greater than 1952," he added.

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General-Purpose Sawing

with High Speed Accuracy, Economy

Model 4B/M2/E2
Equipped with standard work track
(Optional Equipment).

Let us prove to you the many reasons why this MARVEL Hack Saw offers the cheapest, most accurate and fastest "cut-off" method available to you at a low initial cost.

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MARVEL No. 4B
HIGH SPEED HACK SAW

Exclusive features

1. Horizontal Ball Bearing Saw Frame.
2. Screw Feed—Automatic or Hand Operated.
3. Quick Return Stroke—allows greater number of strokes per minute.
4. Simple Positive Coolant System.
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Some Builders Don't Mind Normalcy

Return to peacetime competition doesn't bother builders of automatic tools . . . Tougher on standard equipment makers . . . What happened to Vance plan—*By E. J. Egan, Jr.*

U. S. machine tool builders have been back in a normal, peacetime, competitive era for a year or so now. How do they like it? Well, some do, and some apparently aren't too sure.

The industry at large reports about a 5-month backlog of business. Some firms are loaded up with enough work to keep them going full tilt for another 12 months. Presumably there are others feeling the pinch of less than 5-month backlogs.

Are They Better? . . . Are the very busy firms that much better at selling and manufacturing than their fellow builders who are not doing so well? Not necessarily. Big difference seems to be in the type of machine tool they make.

The company which sometime ago decided to go in for automatic, transfer-type special equipment has gone right along on a wave of enthusiasm for "automation."

But builders of so-called standard, general purpose equipment are facing a tougher market. They're busy competing with other builders, used machinery dealers, low-priced foreign tools, and an occasional Government agency surplus sale.

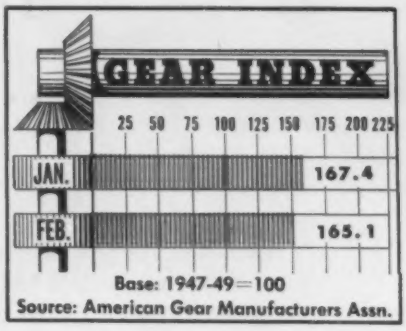
Where's Vance? . . . Department of Defense officials reported an increasing number of machine tool builders have been visiting or telephoning Washington. Their big question: "When is the Defense Dept. going to break loose with a buying program? When is some of that Vance plan money going to be spent?"

No one in Washington seems to know the answer. The Army, Navy and Air Force have some tooling programs down on paper, but they're a long way from the purchase order stage.

Word is that Defense Secretary Wilson hasn't seen these programs in their final, trimmed-down form. And since Mr. Wilson has final say on where and when the money is to be spent, nothing has as yet happened to put these plans in effect.

Heat Hot Machining . . . Hot machining of tough metals and alloys is not entirely a dead issue. Some speculation about the present and near future status of the process was touched off recently at the 6th Annual Industrial Engineering Institute of the University of California.

Biggest obstacle to development of the patented method is the high cost of electric power, according to Dr. Max Kronenberg, consulting engineer of Cincinnati. Dr. Kronenberg addressed the West Coast meeting, told his audience about results of some hot machining tests conducted at International Harvester in Chicago.



Steps Up Output . . . Cooperating in the tests were the R. K. Le Blond Machine Tool Co., The Ohio Crankshaft Co., and the owner of the hot machining patent, The Induction Machining Co. In a production machining run on tough, alloy steel track rollers, the hot method produced 17.8 pieces per hour compared to 6.6 pieces per hour by the conventional cold machining method.

When a constant temperature is maintained in the workpiece, hot machining steps up the metal removal rate considerably. The cutting force drops correspondingly, and with less chatter and deflection a better surface finish is obtained.

Tough Chips . . . But hot machining tends to produce a plasticized chip which is difficult to break. And electric power and heating equipment costs are considered too high at present.

When and if the cost factors can be reduced, hot machining might see a sudden revival of interest. Most logical starting point would be on jobs where the growing list of hard-to-machine metals are a must requirement.

German Tools Fill Markets

German machine tool builders have been doing an ever-expanding business since the war's end. Value of tool exports from West Germany in 1953 was $231 million.

But the optimum point in German tool trade seems to have been passed. In the last 2 years exports to some 23 countries have exceeded imports from them. Machine tool customers in Yugoslavia, for example, owe German builders $16.3 million. Other countries in the Near East and South America are in like positions, and there's little hope for getting the cash to balance out the difference.

West German tool builders must either cut production or attempt to increase competition with U. S. and Britain in their own markets. Neither course offers the Germans an opportunity for healthy profits.

This is what happened at Benton Harbor . . . because three engineers attended a J & L Production Seminar

Saranac Machine Company supervisory and management personnel were informed by J & L's representatives of their continuing research in High Velocity Turning and decided to study the process. Three of their production supervisors attended a Jones & Lamson Production Seminar at Springfield during the Fall of 1952.

These men observed the sensational, actual production-line demonstrations and accumulated the facts concerning High Velocity Turning, resulting from J & L's research. They were convinced on the spot.

A year later, Arthur Yore, Saranac's master mechanic, reports: "We have increased speeds and feeds . . . are now turning at maximum spindle speed of 1500 RPM, feeds .015 to .025 on an average ¼" depth of cut on 1" to 2¼" diameter stock. This is about twice the speed we used before. We have done this on every machine in our factory that is powered and equipped to do it."

"Our turning tool life has increased 25% to 40%. All parts made by this method have a definitely better finish and higher degree of accuracy."

W. F. NEWHOUSE
General Manager
Saranac Machine Co.

PRODUCTION P.S. STUDIES →

J & L's findings on High Velocity Turning may be able to cut costs and improve production for your company. Investigate.

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511 CLINTON ST., SPRINGFIELD, VERMONT, U. S. A. • TURRET LATHES • FAY LATHES
THREAD & FORM GRINDERS • OPTICAL COMPARATORS • THREADING DIES

REPORT TO MANAGEMENT . .

Only a small bomb

Despite all the hoopla, impact of the $999 million excise tax cut on the economy won't be of H-bomb proportions.

Split up among the nation's 60 million workers and their families, the estimated tax saving would increase spending power only 32c per family per week. This is hardly the kind of financial inducement that is destined to put two Cadillacs in every garage.

It'll hurt later on

But one conclusion is certain--the tax cut won't hurt--that is until later when the increase in national debt has to be paid off through other taxes.

For retailers and manufacturers of excised items, passage of the tax bill is certainly welcome relief after the many weeks of stalled sales that resulted as consumers waited to see if the cuts would go through.

Add 1 lb of butter . . .

But primary importance of the excise cut is that it adds vigor to other consumer spending stimulants already at work, and it comes just in time to give the Easter selling season an extra push. Added to this is the recent 8c to 10c drop in butter prices resulting from a cut in government price props.

All these factors are helping create a "now's the time to buy" atmosphere which will cover other consumer goods not directly affected by price cuts.

And don't forget the excise cut, along with other tax reductions made or pending passage of the general tax reform bill, mean that since Jan. 1 taxes will have been slashed $7.4 billion per year. This can't help but perk up the economy.

Is your firm stingy?

How does your company treat its middle management--those executives in between the top management level and the top supervisory line.

If about half of them didn't get salary raises amounting to around 8.4 pct of their base pay since last July, your firm's not keeping up with the average. This finding is based on a survey by American Management Assn. of 1300 middle-level executives.

It appears companies are putting even more stress on supplementary compensation than on direct salary boosts. Survey results showed 96 pct of the companies provide group life insurance benefits, 92 pct have group health, accident or disability insurance programs, and 86 pct have retirement income plans for their middle management executives.

Sell through the soles

There's no doubt this is a competitive era: Gimbels department store in New York has installed a foot massaging machine for its customers. Idea is to give renewed vigor to tired feet so shoppers can stay longer, buy more.

Every 4th piece is on the House... when you use

Ledloy

Get ⅓ or more "bonus" capacity from your screw machines with Ledloy*. Here is a free machining steel with lead added that feeds faster—finishes better—and greatly reduces tool wear. Evenly distributed, submicroscopic particles of lead act to reduce friction between tool and chip. Forgability, carburization and heat treatment are not affected and no health hazards are involved in normal machining, handling, heat treating, or forging.

Our Field Metallurgist will be glad to discuss Ledloy with you and its application to your product. Similar advantages are also obtainable through use of leaded alloy steels which are available in full range of A. I. S. I. or S. A. E. standard analyses. Call or write today for complete information.

*Inland Ledloy License

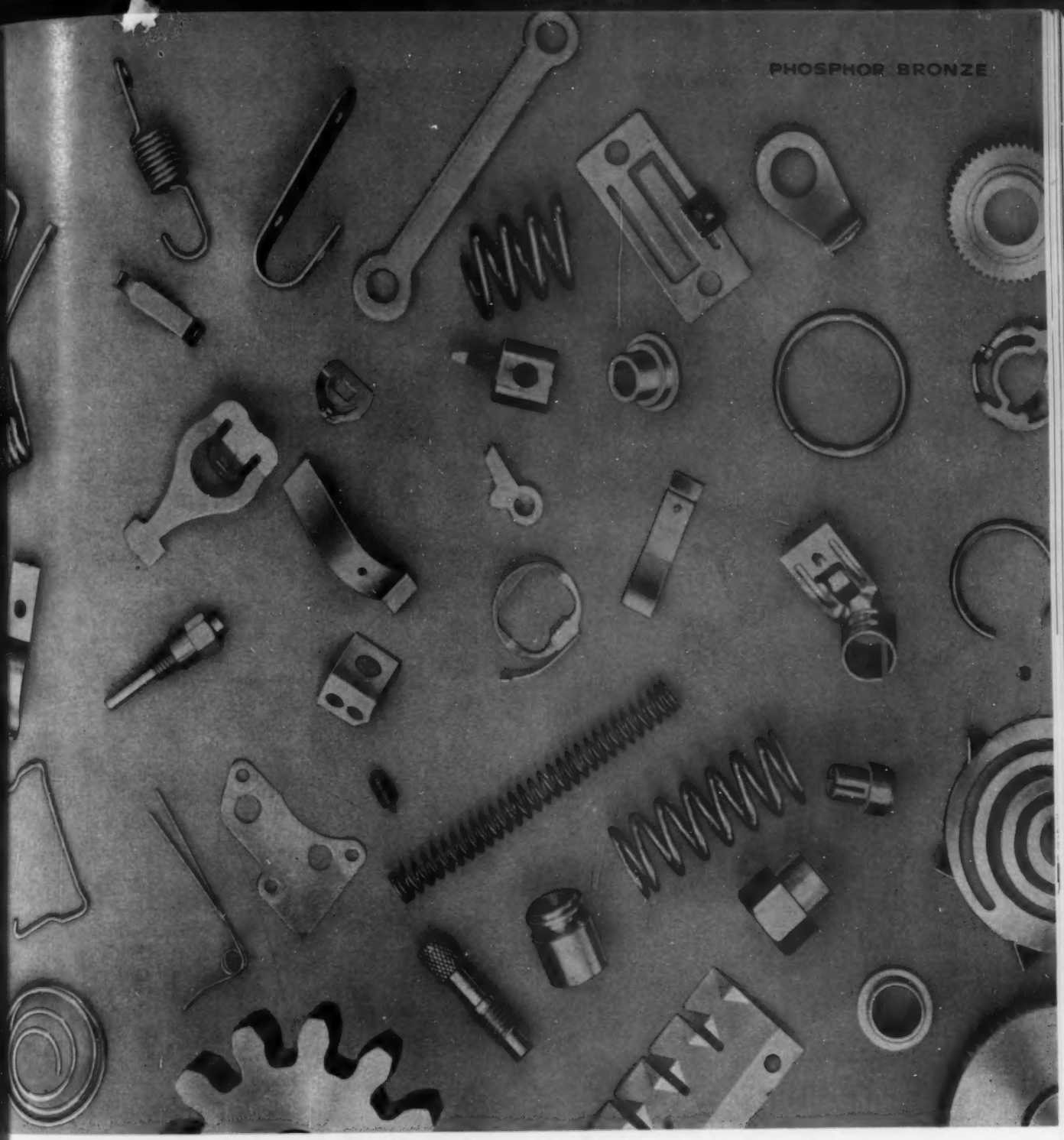
ARISTOLOY STEELS

Warren Steel Division

THE COPPERWELD STEEL COMPANY

Warren, Ohio

For Export—Copperweld Steel International Company
117 Liberty Street, New York, N. Y.



Parts made of tough ANACONDA Phosphor Bronze wear better, last longer

Ten alloys are available in sheets, plates, strips, wire, rods, bars and seamless tubes.

Constant wear and flexings. Periodic stresses. Fatigue and corrosion. These are the things that can knock machine parts out of commission. But they can't hurt those shown above.

Here's why. All of them are made of ANACONDA Phosphor Bronze Alloys. And these copper-tin alloys are strong and tough. They are non-magnetic. They conduct heat and electricity well. And you can work them easily.

In bushings, gears and bearings Phosphor Bronze doggedly resists abrasion. In switches, springs, diaphragms and electrical contacts it keeps its high elasticity under conditions where less rugged alloys fail.

ANACONDA Prosphor Bronze comes in 10 standard compositions (including a free-cutting alloy). Tin content ranges from 1.25% to 10.0%.

Quality? Our record speaks for itself—a recent study of sheet metal covering two years' production shows that claimed unsuitable quality was at the amazingly low ratio of 400 pounds per million pounds shipped.

Tell us what you make and how it's used. We'll help you select the correct Phosphor Bronze Alloy. *The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.* 5484

ANACONDA®
PHOSPHOR BRONZE

Sheets • Plates • Strips • Wire • Rods
Bars • Seamless Tubes • Special Shapes

—Free Publications—

Continued

Precision grinder

New 20-p. catalog issued by Landis Tool Co. describes 18 and 24 in. plain and roll grinders. Catalog contains 37 photographs, 7 sketches, and complete specifications. *Landis Tool Co.*

For free copy circle No. 15 on postcard, p. 119.

Electric motors

sions between the old and new pro- Pamphlet offering comparative dimen- posed Century Nema frames 1 to 30 hp is available. *Century Electric Co.*

For free copy circle No. 16 on postcard, p. 119.

Quantometers

Optical emission Quantometers are especially well-suited for routine analytical production control problems. Full data is given in new brochure. *Applied Research Laboratories*

For free copy circle No. 17 on postcard, p. 119.

Induction motors

Bulletin describing new line of NEMA-frame size induction motors is available from Electric Products Co. Dimensions and illustrations are included. *Electric Products Co.*

For free copy circle No. 18 on postcard, p. 119.

Ammonia

Booklet covering the use of ammonia in the casehardening of steel is being offered by Armour and Co. Pictures, charts and tables are included in booklet. *Armour and Co.*

For free copy circle No. 19 on postcard, p. 119.

Expenditures

How to Get the Most Out of Capital Expenditures, a new 16-p. booket contains in concise and graphic form many answers to the perplexing problem of plant modernization. *Cross Co.*

For free copy circle No. 20 on postcard, p. 119.

Steel coating

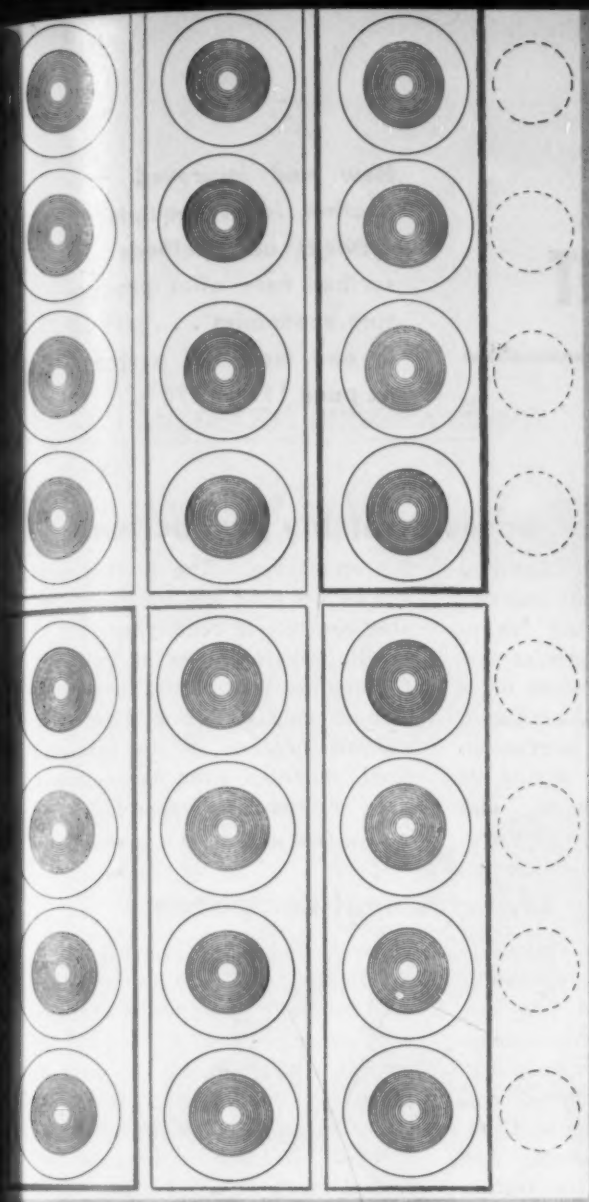
Sharon Steel Corp. has available for immediate distribution a new fact-packed booklet on Sharon's special hot, dipped, zinc coated strip steel Galvanite. *Sharon Steel Corp.*

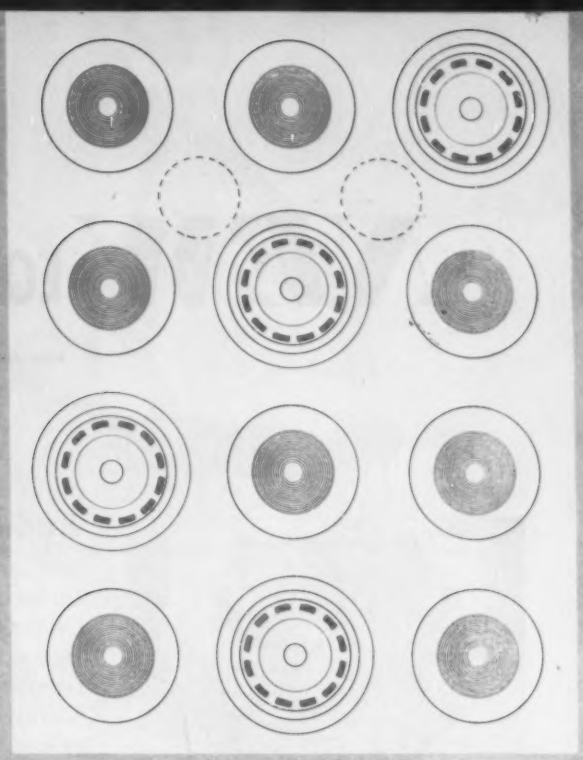
For free copy circle No. 21 on postcard, p. 119.

Flame torches

Arcair Co. announces availability of booklet explaining use of Improved Burner's Aid for those interested in precision cutting with flame torches. Booklet is entitled *Fundamentals of Flame Cutting. Arcair Co.*

For free copy circle No. 22 on postcard, p. 119.





The rules of the game are simple. Take any quantity of steel you want annealed. Figure the time and the moves required to anneal that amount in present-day multiple-stack furnaces. Add sufficient time for furnace maintenance.

Now take the same quantity and figure it for the new Lee Wilson Portable-Base Single-Stack System of annealing. First, double the furnace speed, because the single-stack furnace heats and cools twice as fast. Next, cut down the time required for crane handling of equipment, because the single-stack equipment is smaller and lighter and can be handled easier and there's usually ample storage space for the inner cover close by

Every person interested in sheet and tin coil annealing should play this game

the base being unloaded. Then, eliminate the expensive, non-productive figure for furnace down-time, because the new portable base is quickly disconnected and carried to a repair station and a floating base is dropped in place and, with three simple connections, is ready to go. Time to change bases — 15 minutes.

Now compare the two figures. Is it any wonder that every year more and more steel makers everywhere are switching to Lee Wilson Portable-Base Single-Stack Annealing Systems?

Lee Wilson

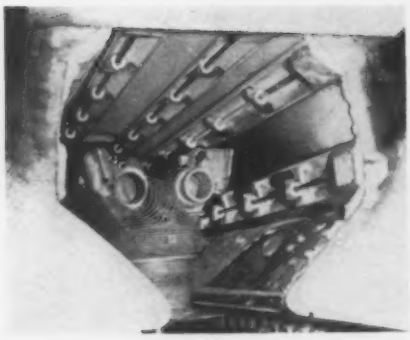
Engineering Company • Inc.

20005 West Lake Road • Cleveland 16, Ohio

BELL TYPE FURNACES ★ RADIANT TUBE HEATING ★ ANNEALING PROCESSES

NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies . . . just fill in and mail the postcard on page 119 or 120



Radiant tunnel increases assembly production

For the precision job of installing shrink-fit parts in aircraft engines, Capital Airlines is using far-infrared radiant heat for precise preheating of engine cylinders on a conveyorized basis. Advantages gained include a 30 pct increase in assembly production, a saving of 25 man-hours per week, and cleaner, cooler working conditions for employees. The flexible radiant tunnel used has infinitely variable control; is readily adapted to handle several types of cylinders for engines that Capital overhauls. Tunnel consists of 6 Chromalox radiant heaters in an insulated shell, mounted over the conveyor line. *Edwin L. Wiegand Co.*

For more data circle No. 23 on postcard, p. 119.

Low cost welding of instrument components

Both disk and point type automatic welding machines are being manufactured for high speed, low cost automatic welding of precious and semiprecious metal contacts to leaf springs, small contact arms, and other instrument components. Gold, silver, platinum, palladium, and iridium are a few of the metals used for the weld. Point contacts may vary in shape from a small pin point up to a dome shape of 0.070 in. diam at the base and a height of 0.060 in. Point welder handles wire diam from 0.022 to 0.075 in. on fine silver. Disks can vary in diam from 0.025 to 0.187 in. in fine silver, or to 0.125 in. in other materials. Welding current is controlled with a Thyratron unit. *Sheffield Corp.*

For more data circle No. 24 on postcard, p. 119.

Ear protectors effective against injurious noise

Straightaway muff-type sound protectors give protection against both high and low-frequency injurious noise, and are safe, sanitary, and comfortable to wear. They require no special fitting, are plainly visible to supervisory personnel, washable, and non-irritating to the skin. Three styles are available: medium cotton weight cotton helmet; lightweight, cool nylon-mesh helmet; and headband type for intermittent use. Protectors are offered on "trial on the job" basis. *David Clark Co., Inc.*

For more data circle No. 25 on postcard, p. 119.

Steam cleaner performs super-duty cleaning jobs

New Series 3000 Hypressure Jenny steam cleaners feature single heating coil, with oil-fired burner and sufficient volume to supply up to four cleaning guns. Available in trailer-mounted, shop portable, or stationary units, the new cleaners may be had with electric motor or gasoline engine drive. Automatic electric ignition instantly starts the unit which will deliver a full powered cleaning blast of 300 gph within 3 min from a cold start; or 100 gph if the unit is to be used for heat transfer purposes. Fuel and solution tanks have 26-gal capacity. Metering controls on fuel and solution lines permit maximum cleaning at lowest cost. *Homestead Valve Mfg. Co.*

For more data circle No. 26 on postcard, p. 119.

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An important announcement

to buyers of metal...

CHASE NOW SELLS STAINLESS STEEL, TOO

Sheets, Plates, Bars, Wire, Pipe and Tubing now available through Chase warehouses and sales offices

Now you can get Stainless Steel from Chase! Along with our regular brass and copper products, Chase can now supply Stainless Steel.

This line has been added as an extra service to metal buyers. Now you can get Stainless Steel, brass and copper from the same source. The same cutting facilities provided on regular Chase products are now available on Stainless Steel orders, too. Anything not in stock locally can be shipped promptly from another Chase warehouse or from the mill.

For service...for quality... in Stainless Steel, too, call your nearest Chase warehouse or sales office.

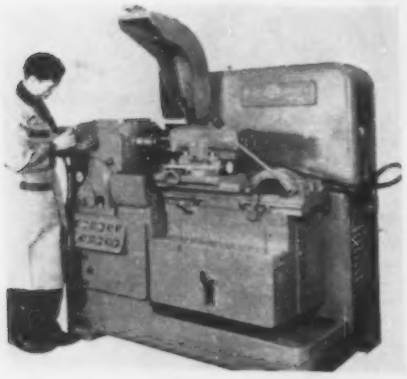
Chase®

BRASS & COPPER CO.

WATERBURY 20, CONNECTICUT • SUBSIDIARY OF
KENNECOTT COPPER CORPORATION

The Nation's Headquarters for Brass & Copper

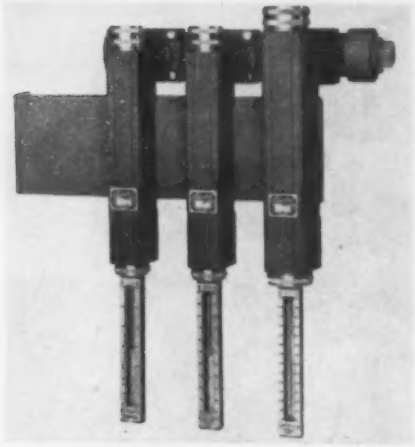
CHASE BRASS & COPPER CO., WATERBURY 20, CONN., Warehouses and Sales Offices at:— Albany† Atlanta Baltimore Boston Chicago Cincinnati Cleveland Dallas Denver† Detroit Houston Indianapolis Kansas City, Mo. Los Angeles Milwaukee Minneapolis Newark New Orleans New York Philadelphia Pittsburgh Providence Rochester† St. Louis San Francisco Seattle Waterbury (†sales office only)



Gear shaver for internal spur or helical gears

Precision shaving operations on internal spur and helical gears from 3 to 12-in. pitch diameter is accomplished on a new Red Ring gear shaving machine. It is designed specifically to finish only internal gears. Gears having up to 4 diametral pitch teeth and face widths up to 2½ in. can be shaved on Model GCR. The workhead permits taper shaving operations with an optional pivoting feature, that facilitates loading and unloading of internal gears having wide faces or integral longshafts. Differential automatic upfeed mechanism includes a master cam that acts as a step gaging device to accurately control feed increments, size, and return to backlash position. *National Broach & Machine Co.*

For more data circle No. 27 on postcard, p. 119.



Measures gas and ammonia in carbo-nitriding

Precision measurement of carrier, enriching gas and ammonia in the carbo-nitriding process is the function of the new Nicarbo-Guard. The unit can be used with any type furnace properly designed for carbo-nitriding, and can also be used for controlling carrier and enriching gas for straight carburizing. Ten standard sizes are available. Control valves are built into the top of each flometer where the operator can adjust the flow of the carrier, enriching gas and ammonia and see exactly what he's doing as he makes the adjustment. Unit includes mixing manifold with 1¼-in. outlet connections at both ends; piping can be brought from either side of the unit. Individual flo-meters of the Nicarbo Guard are easy to read. Each meter has only one moving part and can be cleaned in less than 2 min. *Waukee Engineering Co.*

For more data circle No. 28 on postcard, p. 119.

Powder actuated tool drives heavy shank fastener

With a new powder-actuated tool heavy shank fasteners can be successfully driven into structural steel plates 1 in. thick and into hardest concrete. Pins and studs driven into 1-in. structural steel with the super-power Jobmaster have a holding power up to 10,000 lb. The tool weighs less than 8 lb and is 15 in. long. It is designed for one or two-hand operation and sets pins and studs ⅜ in. in thread or head diameter at an average rate of one or more a minute. It uses any of 19 Ramset-designed fasteners, and has a choice of 4 powder loads to handle virtually any heavy-duty construction assignment into thick structural steel and hardest concrete. New circle-set shield permits setting of fasteners as close as 1¼ in. from edge of the shield. Discharge is impossible until the tool is pressed firmly against the work surface in an almost perpendicular position. *Ramset Div., Olin Industries, Inc.*

For more data circle No. 29 on postcard, p. 119.

Band machine features versatility at low cost

New line of 16-in. band machines with 12-in. thickness capacity for shop use are engineered and powered for tough, straight or curved metal sawing operations and are adequate for sawing woods, plastics and numerous other materials. Machines are easily arranged for band filing, metal polishing and carbide finishing as well as slicing materials simply by applying the proper band tool, tool guides, and the use of inexpensive attachments and accessories built for the machine. Carbide tools can be finished on these machines. Frame construction of the models reflects the same heavy gage steel and welded box frame design found in DoAll's more expensive models. The new line includes models with fixed or variable speed controls with speed range between 50 and 5200 fpm. *DoAll Co.*

For more data circle No. 30 on postcard, p. 119.
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INSUL-MASTIC, of course!

Once and for all these Oil Refinery Tanks are being coated with INSUL-MASTIC TYPE "D"

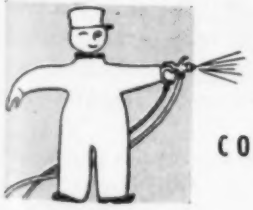
Once an INSUL-MASTIC protective coating is applied it will prevent corrosion for practically *all* time.

INSUL-MASTIC is a heavy asphaltic coating, fortified with Gilsonite and reinforced with mica, asbestos and ceramic clay. It is applied in one thick coat and will prevent corrosion under extreme conditions such as acid or alkali fumes or constant moisture. INSUL-MASTIC TYPE "D" contains cork, an excellent insulator. When applied ¼" thick on heated tanks it will cut your fuel bills considerably.

We can show you applications many years old in plants where constant painting was once the rule. These INSUL-MASTIC coatings have not been renewed since they were applied several years ago. They have saved considerable maintenance money for their owners.

Think first of the coatings that last!

Before you build, take advantage of our consultant service. Proper coating recommendations now will prevent corrosion worries and expenses later.



Insul-Mastic

CORPORATION OF AMERICA • OLIVER BUILDING, PITTSBURGH 22, PA.

Representatives in Principal Cities

Irradiated plastics

Irradiated polyethylene, representing an advance in heat and chemical resistance over normal polyethylene is being offered experimentally in narrow film form. Designated Irrathene, the new material's superior properties result from bombardment of polyethylene with high-energy cathode rays from million-volt electron generators. Vulcanization of the polymer during irradiation contributes form stability at 300-350F and resistance to cracking when the material is stressed and in contact with solvents or other chemicals. The new plastic is expected to expand industrial and consumer use of polyethylene plastics. *General Electric Co.*

For more data circle No. 31 on postcard, p. 119.

Safety clutch

Tele-Trol electronic two-handed safety clutch is designed for use on all devices requiring single-trip or single cycle control. Machines cannot be tripped in any fashion except by simultaneous motion of both hands which sends a single

electrical pulse to the solenoid. All operator hazards are eliminated. More production is claimed because only finger touch is required, relieving fatigue and lost motion. Operators soon synchronize load, trip and unload motions into a time-saving sequence. *Benchmaster Mfg. Co.*

For more data circle No. 32 on postcard, p. 119.
Turn Page

60

chemical checks of every heat keep TIMKEN® stainless steel forging bars uniform

WE SUBJECT every heat of stainless steel to 60 separate checks for chemical composition. These tests tell us when the analysis is *right.* This is one reason why, with Timken® stainless steel forging bars, you get uniform physical and chemical properties, uniform forgeability, uniform response to heat treatment. As a result, you don't have to change your shop practices with every shipment of material. You save production time, cut scrap loss, get a top-quality finished product.

Besides making sure you get uniform steel, we make sure you get it when promised. And we have a Technical Staff that'll help you choose the correct analysis of Timken stainless forging steel for your requirements. Write for your free copies of our technical bulletins on stainless forging steels. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD — THROUGH EXPERIENCE AND RESEARCH

TIMKEN
TRADE-MARK REG. U.S. PAT. OFF.
Fine Alloy
STEEL

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

—New Equipment—

Continued

Hobbing press

A simplified and improved hydraulic power system is the feature of this 500-ton hobbing press. The new system is designed with a solid steel subplate that has two functions: First, the subplate serves as a readily accessible mounting for all necessary control valves; secondly, with valves mounted in close proximity, the advantage of the system lies in saving space and piping and in reducing loss of pressure in the lines. Results in the practical advantage of greater press speeds at lower cost. Handwheel type of directional control is available. Where fast acting presses are desired, lever actuated 4-way valve is usually preferred. *M & N Hydraulic Press Co.*

For more data circle No. 33 on postcard, p. 119.

Paint spray booth coat

Peel Filmite is a new type spray booth paint film coat. This fireproof and flameproof peelable film gives all plants assured fire safety. It is used with regular spraying equipment and has excellent resistance to alkalis, acids, oils, grease, fats, alcohol and gasoline. The film sprays on easily and evenly. Its uniform white, opaque coating dries in about 10 min, giving a firm, non-greasy surface. When paint overspray accumulates, the operator scores the coating and peels it off in big sheets. *DuBois Co., Inc.*

For more data circle No. 34 on postcard, p. 119.

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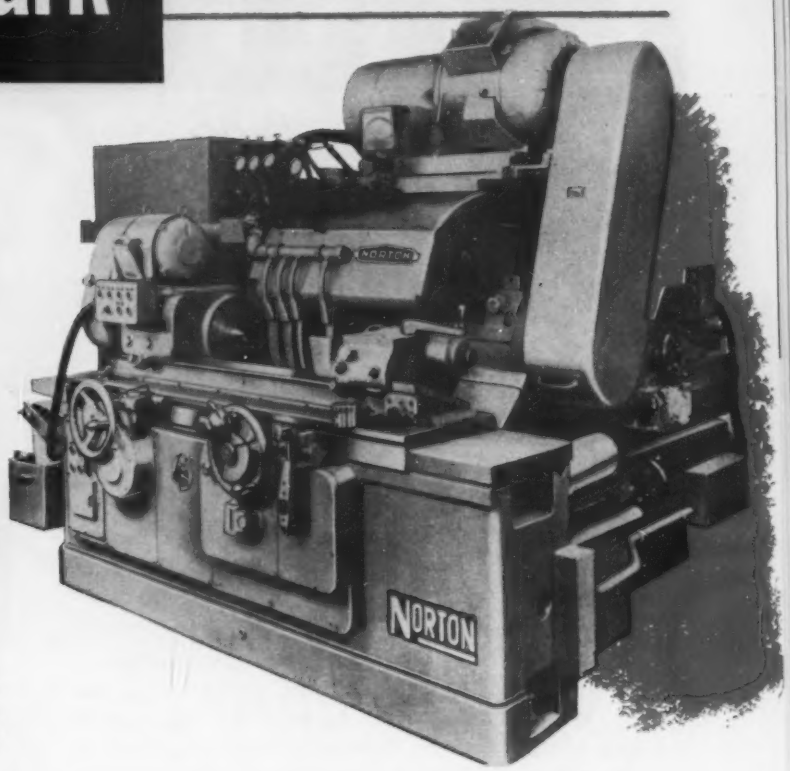
Another first

...For Delpark Filtration



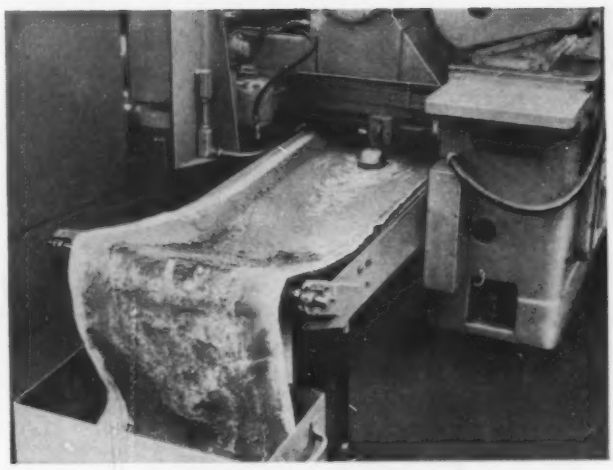
NORTON'S GRINDER Features *Built-in* Delpark Filtration

Recognition by Norton engineers of DELPARK as the finest in coolant filtration is acknowledged by the incorporating of DELPARK Filtration *into* the design of a new grinding machine introduced by Norton.

This machine is the Norton Type CM-1 Heavy Duty Semiautomatic Multi-Wheel Grinder. This unit utilizes several grinding wheels mounted between bearings for simultaneously grinding different diameters on the work piece in a single plunge-grind operation. Heavy sludge loads produced are immediately removed eliminating time loss necessary to clean reservoirs. Coolant supply is constantly kept clean and free of particles which would spoil the finish of ground work.

Thank you Norton, for your recognition of DELPARK Filtration as the finest.

Write for the Delpark brochure on Norton's new type grinder



Norton Type CM-1 Heavy Duty Semiautomatic Multi-Wheel Grinder with built-in Delpark Filtration

Delpark INDUSTRIAL FILTRATION

BACKED BY MORE THAN 30 YEARS EXPERIENCE IN INDUSTRIAL FILTRATION

INDUSTRIAL FILTRATION COMPANY, 91 INDUSTRIAL AVENUE, LEBANON, INDIANA

Abrasive screen

Sand Screen, a new nonclogging open-mesh abrasive material, is designed for sanding operations where loading or glazing is a problem. The sanding, screen-like abrasive is coated uniformly on both sides with silicon carbide grain. Open-mesh

construction reduces loading to a minimum, by permitting sanding residue to flow freely through the openings. Material can be used on both sides because sharpness of the abrasive grain is retained on both sides. Sand Screen can be used wet or dry, for both machine and hand sanding operations. Comes in full sheets, cut sheets and disks, in grit sizes 180 and finer. *Carborundum Co.*

For more data circle No. 35 on postcard, p. 119.

Super thin rings

Teflon super-thin V-rings for pumps, valves, and all types of packing are said to give a better seal in one-half the space at one-third the cost. Resiliency makes possible a tighter seal at lower pres-

sures. They make possible the design of smaller and lighter units by reducing packing gland length and diameter. The rings are chemically inert, suitable for use in temperatures from −150 to +550; natural slipperiness reduces friction. *Reid Enterprises.*

For more data circle No. 36 on postcard, p. 119.

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Comparator-microphotometer has sensitivity

Console model comparator-microphotometer includes performance and mechanical innovations. Desk-height cabinet, foot control for drive and left-hand positioning of panel switches make the instrument convenient and minimize operator fatigue. Performance features include sensitivity that is sufficient to yield full-scale deflection for effective slit size of 1 micron x 0.7mm or better. Reproducibility exceeds ±0.25 pct; speed is sufficient to measure 4 lines per min. An 18 x 9 mm area of the plate is projected onto the 11 x 11 in. translucent screen at a magnification of 15X. Instrument accommodates two 4 x 10 in. plates. *Jarrell-Ash Co.*

For more data circle No. 37 on postcard, p. 119.

Cutting tool holder

The holder barrel of the Wej-Lok tool holder is of one piece construction, accurately machined to hold cutting tools and the several holder parts that prevent the tools from turning or coming out once they are locked in place. A rectangular wedge is located in the head portion

of the holder where it is moved back and forth in its channel by the retainer to either lock or unlock inserted tools. Normal torque of tool in operation will always tend to tighten wedging action and more firmly lock the tool. *Detroit Reamer Tool Co.*

For more data circle No. 38 on postcard, p. 119.

Atomic vault

The Raysist vault simplifies transportation and storage of radioactive materials and at the same time provides a relatively indestructible container for safekeeping of microfilm or other valuable records. It is only a fraction of the size of containers now in common use. Basic material is Ferrolum lead clad steel so that the unit combines the high molecular density and shielding properties of lead with the great physical strength of steel. *Knapp Mills Inc.*

For more data circle No. 39 on postcard, p. 119.

The Iron Age

SALUTES

Charles E. Zimmerman

Impatience with conventional roads to success led him to develop his own multi-million dollar business.

CHARLES E. ZIMMERMAN, president of Consultants & Designers, Inc., built a tremendously successful career by following the un-beaten track. In 1940, for example, when business was slow in the drafting rooms of Designing Service Co., he asked to be transferred to the sales department. Friends told him frankly that they thought he was crazy.

However, Charlie promptly confounded the wiseacres by landing a big order from an account thought to be dead. Three years later he became sales manager and in another three years was made vice-president and general manager of Design Service Sales Co., a subsidiary of Designing Service Co.

But Charlie wasn't content to stand still, even though he was standing on one of the topmost rungs of the ladder. In 1950 he resigned from Designing Service and took stock of his assets: 1) An idea for his own business, 2) $2900 in cash, 3) a lot of friends and 4) nerve enough to buck expert opinion that the time was not ripe for starting a new business.

Six months before the outbreak of the Korean war he launched Consultants & Designers, Inc. The firm's operation is a design, drafting and technical service for manufacturer's engineering departments. Today, Charlie's company employs over 500 people, 61 pct of whom are graduate engineers. This year it is expected to gross around $5 million.

Charlie commutes to New York from Long Island where he lives with his wife and two daughters. His hobbies, driving sports cars and golf balls, get a fair share of attention on weekends and holidays.

The Iron Age

INTRODUCES

Edward L. Soule, Jr., named president and general manager, SOULE STEEL CO.

William P. Drake, named president, Industrial Chemicals Div., PENNSYLVANIA SALT MFG. CO., Philadelphia, **Albert H. Clem,** becomes president, Chemical Specialties Div.; and **William F. Mitchell,** becomes vice-president in charge of engineering, purchasing and traffic.

E. J. McGrath, elected president, FRUEHAUF TRAILER FINANCE CO.; and **James Bruce,** elected a director of Fruehauf Trailer Co.

Sigmund L. Holverstott, appointed assistant to vice-president — Sales, BETHLEHEM STEEL CO., Bethlehem, Pa. He succeeds Edward E. Goodwillie, who has retired.

Elmer C. Martin, appointed assistant to vice-president, UNIVERSAL ATLAS CEMENT CO., New York; and **Harry T. Swanson,** named manager, Atlas White Cement Bureau.

William Kerber, appointed director, Iron & Steel Div., Business & Defense Services Administration, U. S. DEPT. OF COMMERCE.

Sam Ernst, appointed sales engineer, Chicago office, METAL CARBIDES CORP., Youngstown; and **Joseph R. Weiss, Jr.,** becomes sales engineer, Cincinnati office.

William J. McManus, appointed sales engineer, THE HYDRAULIC PRESS MFG. CO., Mt. Gilead, Ohio; and Raymond W. Arnesen, appointed sales engineer.

James M. Jelme, appointed director of industrial relations, JOSEPH T. RYERSON & SON, INC.

John W. Gosselin, appointed vice-president, PHOENIX MFG. CO., Joliet, Ill.

C. B. Campbell, appointed chief engineer, Steam Div., WESTINGHOUSE ELECTRIC CORP., Philadelphia.

Dr. T. M. Vial, joins the New Product Development Dept., AMERICAN CYANAMID CO., New York.

Arthur W. Gulliver, appointed application engineer, New York office staff, DRAVO CORP., Pittsburgh.

Vernon E. Nickel, appointed manager, Tractor Sales Dept., Tractor & Implement Div., FORD MOTOR CO., Birmingham, Mich.; and **Thomas G. Heydon,** appointed manager of Sales Research Dept.

John W. Spoor, appointed to newly-created post of assistant division manager, Welding Products Div., A. O. SMITH CORP., Milwaukee, and **Erv A. Steidl,** becomes sales engineer, Wisconsin, same division.

Jack Jaso, becomes application engineer, Chicago district, THE LINCOLN ELECTRIC CO., Cleveland.

Peter J. Short, Jr., promoted to manager of real estate, LUKENS STEEL CO., Coatesville, Pa.

W. G. Lanterman, appointed Cleveland regional manager, LAMSON CORP., Syracuse.

F. JEROME TONE, JR., made senior vice-president, The Carborundum Co., Niagara Falls, N. Y.

J. H. BEARDSLEY, appointed executive vice - president, Bryant Chucking Grinder Co., Springfield, Vt.

JACK ROTHSCHILD, appointed vice-president, Eastern Brass & Copper Co., New York.

Personnel

Donald W. Walker, appointed product manager for pig, ingot and billet, KAISER ALUMINUM & CHEMICAL SALES, INC., Oakland.

Lloyd W. Ingles, named superintendent, new Allen Mine, Weston, Colo., COLORADO FUEL & IRON CORP.

Charles H. Schminke, appointed field sales manager, RAMSET FASTENERS, INC., a division of Olin Industries, Inc., Cleveland.

Norman K. Anderson, named general sales manager, WARNER ELECTRIC BRAKE & CLUTCH CO., Beloit, Wis.

Jeffrey Sidebotham, joins administrative staff, PASTUSHIN AVIATION CORP., Los Angeles.

W. Wendell Drummond, joins staff BJORKSTEN RESEARCH LABORATORIES, INC.

T. H. Wakeman, appointed mid-continent district sales manager, KAISER STEEL CORP., Tulsa.

William J. Lobrovich, appointed manager of production engineering, CONTINENTAL CAN CO., New York; and **Ernest P. Berner,** named production engineer—assembly.

T. N. Baker, appointed general sales manager, CONSOLIDATED TOOL & PRODUCTS CO., Los Angeles.

Robert J. Wright, appointed manager of foreign operations, AIRESEARCH MFG. CO., Los Angeles.

D. H. Gardner, named Industrial Furnace division general manager, SUNBEAM CORP., Chicago.

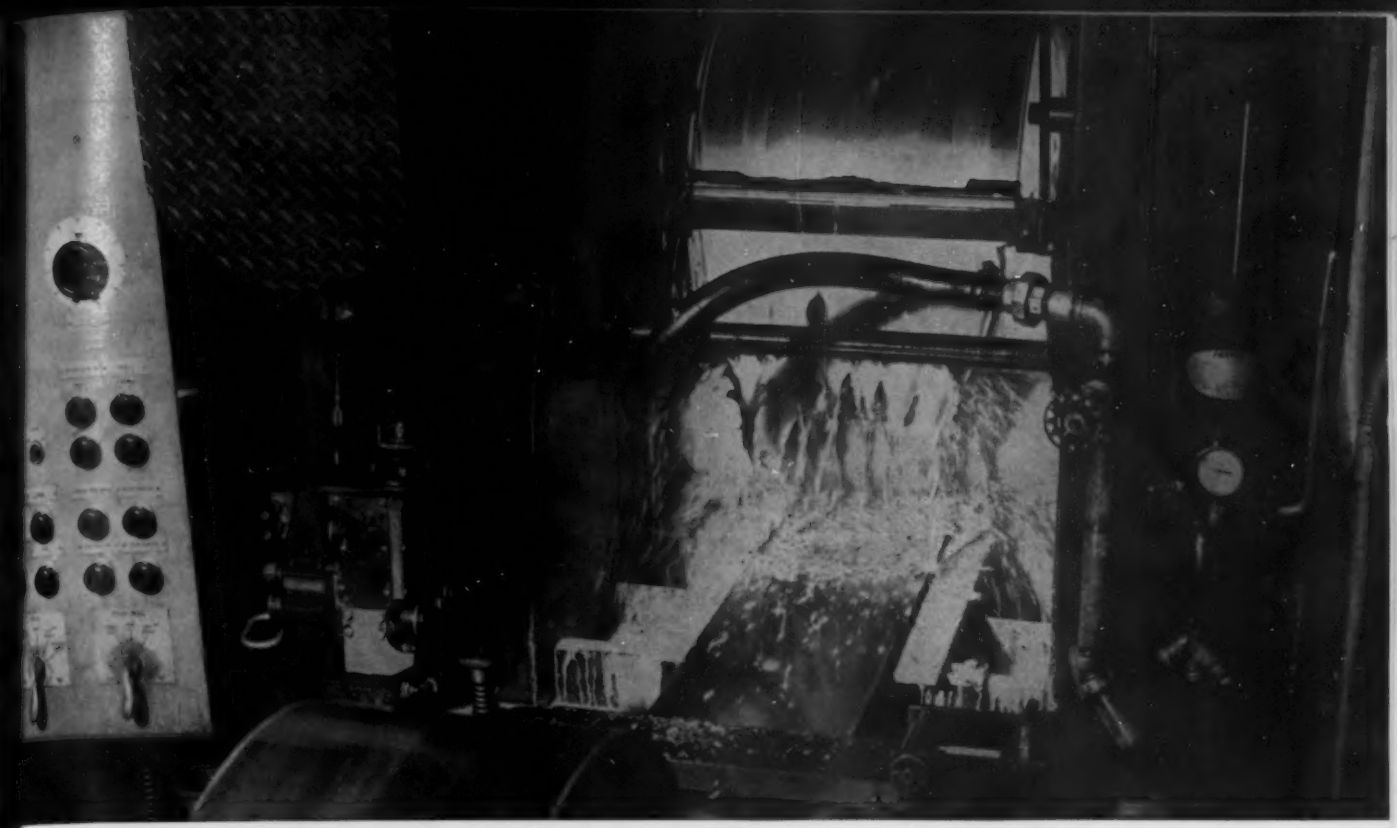
James L. Goodwin, appointed Cleveland district manager, Sterling Abrasives Div., THE CLEVELAND QUARRIES CO., Tiffin, Ohio.

FREDERICK T. KEELER, named director of sales, The Carborundum Co.

J. A. CUNEO, elected vice-president, Sales, Fairbanks, Morse & Co.

EDWIN Y. BREADY, named division manager, Hallowell Pressed Steel Div., Standard Pressed Steel Co.

J. H. WEBBER, named assistant sales manager, Tubular Products, Kaiser Steel Corp., Oakland.



NEW SUNOCO EMULSIFYING ROLLING OIL EASIER TO USE, LASTS LONGER

mixes readily in hard or cold water—forms whiter and more table emulsions that can be used for a longer time. The lower iscosity of new Sunoco Emulsifying Rolling Oil makes it asier to pump from storage tanks. These improvements are he result of improved refining techniques made possible by everal new multimillion-dollar refining units.

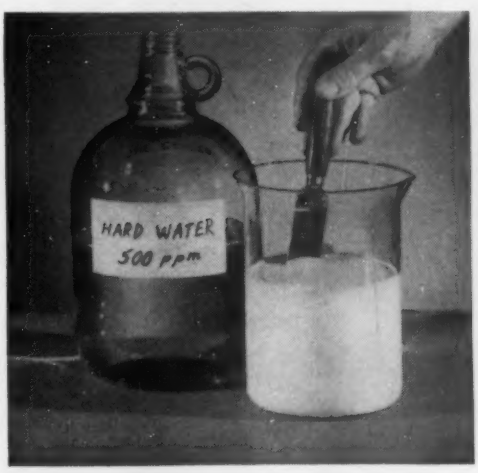
Users report cleaner rolls, reduced spalling, and absence of gumming. The result is lower power consumption and higher mill speeds—as much as 50% in many cases. In the annealing operations, Sunoco Emulsifying Rolling Oil burns off cleanly—usually making cleaning unnecessary. All of these advantages contribute to lower cost operation.

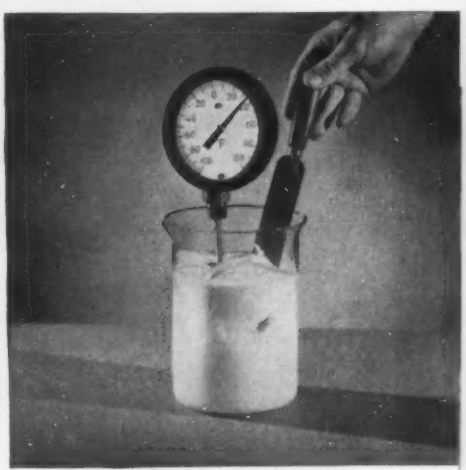
You can also use Sunoco Emulsifying Rolling Oil advantageously for rust proofing hot rolled sheets after pickling, and as a die lubricant in cold drawing steel bars.

The full story about this new oil is well worth your listening. Care to hear it? Just contact your Sun Oil Company representative. Or write Dept. **IA-4.**

TESTS SHOW HOW READILY THIS NEW OIL FORMS STABLE EMULSIONS

HARD WATER—Tested in dozens of samples of water obtained from industrial plants having hard water problems. Never failed to form a stable emulsion.





COLD WATER—Forms a stable emulsion in the coldest water . . . even ice water.

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—Personnel—

Continued

A. A. Mattes, named purchasing agent in charge of tooling and subcontracting, ALLIS-CHALMERS MFG. CO., Milwaukee, **F. L. Back,** becomes assistant purchasing agent; **D. E. Bender,** named assistant purchasing agent, foundry products and supplies section; and **J. A. Williams,** named assistant supervisor, expediting section.

Robert Drake, becomes field sales representative, Atlantic District, GENERAL ELECTRIC CO., Carboloy Dept.

William Gormley, appointed representative, Industrial Sales Div., Ohio, HENRY DISSTON & SONS, INC., Philadelphia.

Robert LePage, appointed supervisor, Process Engineering Section of the Abrasives Laboratory, MINNESOTA MINING & MFG. CO.

Sidney J. Tuson, appointed a sales representative, Foundry Sales Div., FREDERIC B. STEVENS, INC., Detroit.

Maurice E. Grant, has been appointed district engineering representative of THE OILGEAR CO., New Rockford, Ill., office.

Lance Mosdell, becomes plant manager, BENCHMASTER MFG. CO., Gardena, Calif.

T. A. Marshall, Jr., named director of public relations, THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS.

OBITUARIES

W. S. Robinson, vice-president and director, Muncie Malleable Foundry Co., Muncie, Ind. He had been connected with the Malleable Iron Foundry Industry for approximately sixty-seven years.

Martin J. Anderson, director of engineering research, Mathews Conveyer Co., Ellwood City, Pa. suddenly in Mt. Dora, Fla.

The Iron Age
FOUNDED 1855
Technical Articles

Less manual lifting—

Improved Forging Methods Save Steel, Raise Shell Output

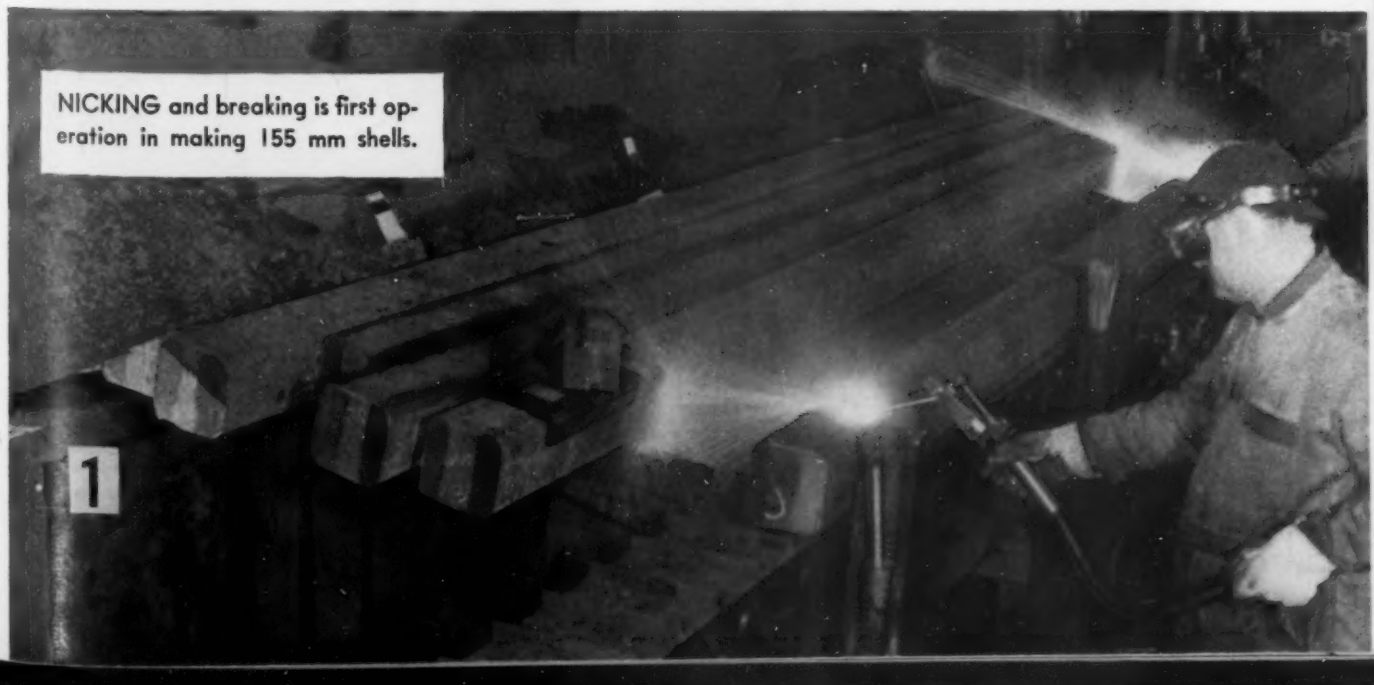
By W. G. Patton
Asst. Technical Editor

◆ Use of powerful, vertical all-steel presses in place of the conventional pierce-and-upset, horizontal draw bench method has greatly increased production of large, hot-forged artillery shells . . . In addition to manpower conservation, many machine hours have been eliminated . . . Savings up to 35 lb. of steel per 155 mm shell are possible.

◆ Oliver Corp., South Bend, has developed this efficient, smooth-functioning yet flexible hot forging operation . . . All manual lifting is eliminated . . . Use of floating dies on some operations increases accuracy, lessens wear . . . Controlled, slow cooling assures uniform microstructure for optimum machinability.

◆ GREATER CONCENTRICITY of forgings is the key to efficient production of 155 mm shells by the Oliver Corp. at its South Bend works. Through the use of powerful vertical Verson presses that are spaced closely together and ingenious manipulators that transfer hot billets rapidly between presses, considerable manpower has been conserved in the production of shell forgings.

Most important about the Oliver Corp. in-



NICKING and breaking is first operation in making 155 mm shells.

1

Vertical presses and lubricated double punches raise tool life . . .

stallation perhaps is the fact that an improved forging technique has been developed that will help assure volume production of artillery shells in the event of another national emergency.

While Oliver Corp. is not the only firm using vertical presses to produce shells for Ordnance, this firm, working with Verson engineers, has pioneered several important recent developments in shell forging methods.

For example, where conventional forging methods — the techniques employed during World War II—are used, billets weighing up to 150 lb are required for a 155 mm shell. Ordnance specifications permit a range of 116 to 150 lb. Oliver Corp., however, is able to work consistently in the lower specification range, since concentricity is much more closely held than where the conventional pierce-and-upset, horizontal draw bench method is used.

Big tonnage savings

Material savings using the vertical presses method may add up to tremendous steel tonnages in a big shell program. To illustrate: by working consistently on the low side of the range, it is estimated the average amount of steel saved per 155 mm shell may be as much as 35 lb. Thus for every 100,000 shells produced, the new method may save up to 1750 tons of SAE 1050 steel.

Where the pierce-upset-draw method was employed, as many as 7 forming operations were necessary. The time cycle was also substantially longer in the case of the upset-draw bench method. More floor space was required. Since presses were spaced further apart, additional materials handling was necessary.

Where the drawbench method is employed, the punch must be suspended at some distance from the piercing point. Wear usually occurs at a single location. Using a vertical press instead of a drawbench, the piercing punch is suspended from the back side. Weight is downward. Wear tends to be uniform, rather than concentrated on one side. It is also possible to use floating dies in some operations. This not only increases accuracy of the forging but also tends to minimize wear.

Shell forging experience of Oliver Corp. during World War II showed that on a horizontal drawbench wear tended to concentrate at the bottom of the rings as well as on the mandrel. In some cases a 16 ft mandrel, supported at the back, was used. Because of wear concentration, tool life was limited.

Using vertical presses and lubricated double punches, up to 300 shells per grind may be produced. Punches can be reground three or four times before scrapping is necessary.

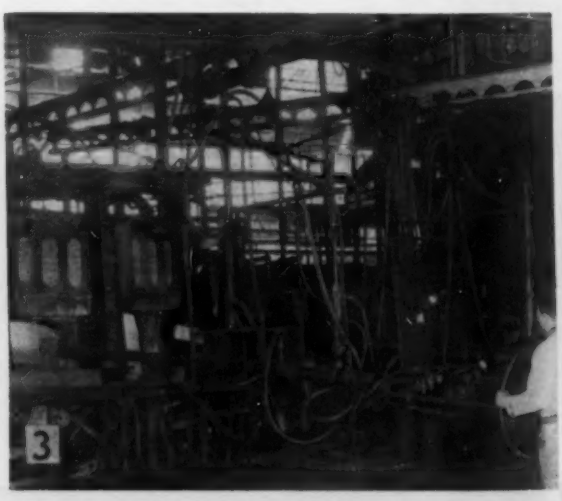
Initial operation at South Bend is nicking and breaking SAE 1050 6-in. round cornered square stock. A wooden jig is used to mark bars to length. Length of billets is approximately 12¼ in.

Ordnance specifications permit a billet weight range from 116 to 150 lb max but Oliver Corp. consistently works on the low side of this range, seldom exceeding 121 lb of steel. Because concentricity can be held within narrow limits, narrower working specifications are possible.

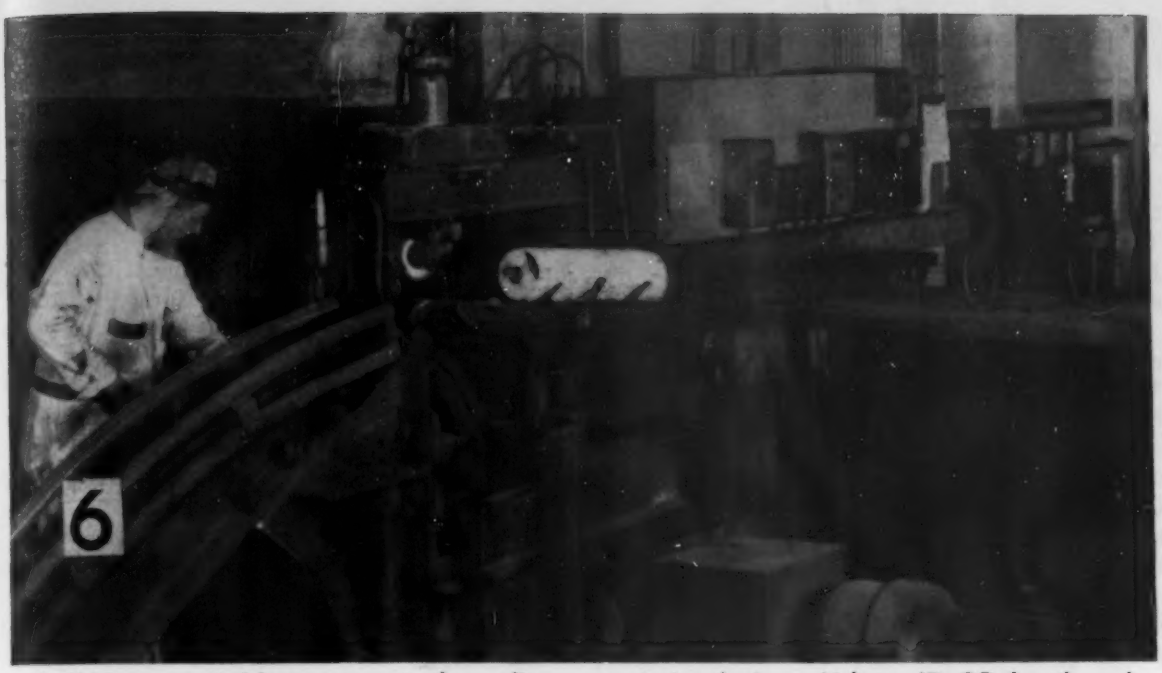
After nicking on one side with an oxygen electric torch, billets are broken off in a 400-ton mechanical press.

Billets are carefully inspected following this operation. Slivers, if any, are removed. This assures elimination of surface defects, particularly on the inner surface, that might result

BILLETS are broken in a 400-ton press after nicking with an oxygen electric torch. Billets are approximately 12¼ in. long.



BROKEN BILLETS are picked up from conveyor and placed on end on the rotary hearth. The manipulator travels on a monorail conveyor.



SHELLS are carried by conveyor to the cooling chamber following the sizing operation. Before entering the base thickness, ID, OD, length, and surface condition are checked periodically.

from slivers formed during the breaking operation.

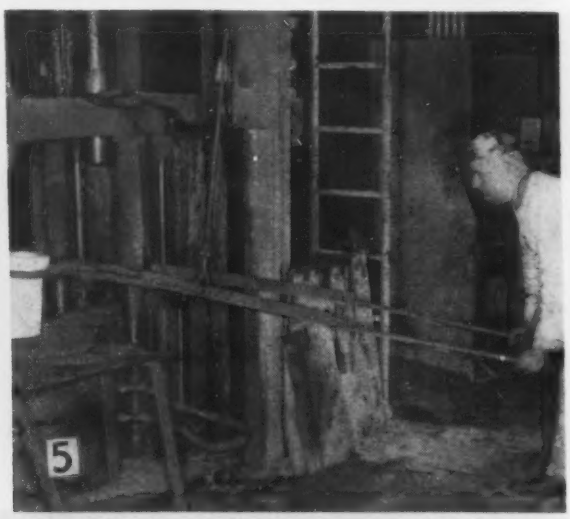
Billets are carried by gravity on a roller conveyor to the Lee Wilson rotary heating furnace. A specially designed manipulator, equipped with water cooled jaws and riding on a monorail, permits the operator to pick the billet up from the conveyor, turn to an upright position and insert through the furnace door. Billets stand on end, four deep inside the rotary furnace. Sojourn in the furnace is approximately two hr.

Temperature of the rotary furnace is closely held. Two temperature zones are maintained; the entering zone is held at 2100 deg F; the remaining half of the furnace is held at 2300 deg F. Two-zone control is maintained to minimize heating time as well as reduce scaling. The Lee Wilson rotary furnace is fired by 1000 btu city gas.

Heated billets are lifted out of the furnace and deposited on a powered chain conveyor. The billet rides on two rails which hold it in a diagonal position. Four jets set at 90 deg are directed at each of the faces of the heated billet. Two of the jets are set to fire backwards; two jets fired forward catch both ends and the sides of the billet. Cold water at 2500 psi is used for descaling.

Following automatic unloading from a pusher-type conveyor, billets are placed in an upright position in a 400-ton Verson press for

UNLOADED from a pusher-type conveyor, heated billets are then placed in a 400-ton press for the initial forming or "cabbaging" operation.



TONGS of special design, suspended from a monorail, relieve much of the manual effort involved in handling 155 mm shells.

Heat resisting tool steel containing 5 pct chrome and 1 pct vanadium is used for punches . . .

the initial forming or cabbaging operation. This operation combines piercing and forming. In addition to piercing to a depth of 3 in., the shape of the square billet is changed to round.

Heat resisting tool steel containing 5 pct chrome and 1 pct vanadium is used for punches. The die is approximately the same composition. No stripper is required for this press.

A double punch and a shuttle are used. This permits cooling and automatic lubricating of the punch between operations. The punch lubricant is graphite suspended in oil. A swabber is used on the die only.

Following the cabbaging operation, the billet is removed from the die by manipulators suspended from an I-beam. As the billet is swung out of the die, it is simultaneously moved along the I-beam and inserted in a 600-ton Verson press for piercing.

No manual lifting is involved. As in the previous press, punch lubrication is automatic. A swabber lubricates the die only. During this operation, the punch completes the piercing operation. A fixed die pot is used and a stripper plate and knockout are provided. During this operation, a boss is formed on the bottom of the shell. This provides extra metal for centering, required for machining. The excess metal is removed after final machining.

Essential forming is practically completed in the second press operation. Transfer is accomplished in the same way as between press No. 1 and No. 2.

The third operation, performed in a 600-ton Verson vertical press, is essentially an internal and external sizing operation. During this operation, the shell is pushed through the die onto a counter-weighted cradle. A floating die is used in this press. The punch is ground 0.050 in. smaller than the second punch. As the shell is pushed through the die, metal tends to gather around the punch.

Following the forming operations, shell forgings are cooled at a carefully controlled rate. Prior to inserting in the 60-ft long cooling chamber, forgings are inspected periodically for base thickness, I D, O D, length and surface condition.

Forgings cooled carefully

Loading is accomplished by sliding the shells horizontally onto metal pins attached to the conveyor. This indexing type chain conveyor carries cross members, each having six pegs. Pegs are spaced on 12-in. centers.

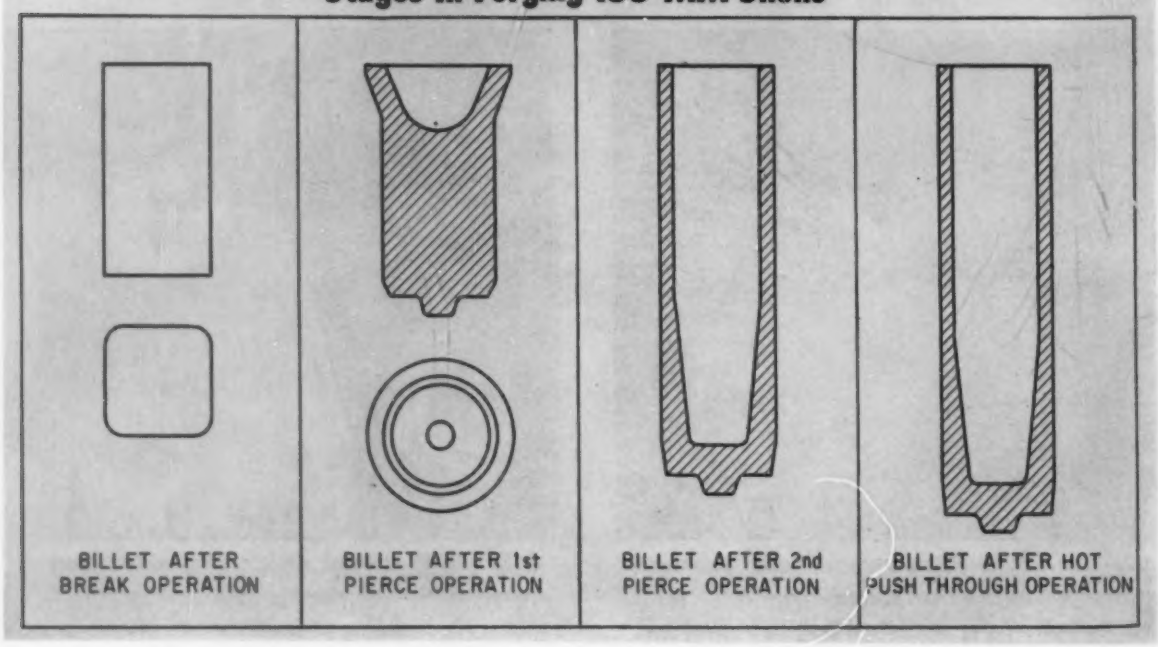
Length of the insulated cooling chamber is approximately 30 ft. Normally, about 2 hr is required to travel this distance.

As shells enter the cooling chamber they are at a temperature of approximately 1500 deg F. During the 2 hr period, they will cool down to about 900 deg F. This controlled cycle protects the shells against unequalized cooling and assures the development of a uniform, readily machinable spheroidized structure.

After the forgings reach 900 deg F, all transformation has occurred. A cold air blast is used to cool the load down to about 300 deg F which permits handling.

Following another inspection, the shells are ready for hot nosing and rough and final machining.

Stages In Forging 155-MM Shells



Strength plus ductility—

STAINLESS SPRINGS Have Long Service Life

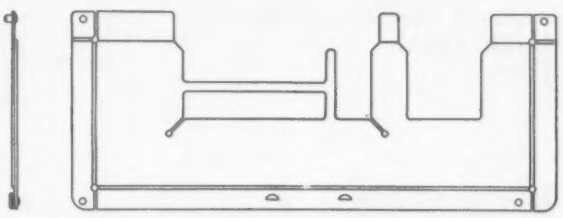
◆ TYPE 301 STAINLESS is giving superior service life in installations requiring constant flexing at high speeds over long periods of use. Though stainless steel springs are not unusual, their use by Addressograph-Multigraph Corp., Cleveland, is based on superior physical properties rather than corrosion resistance. Both their improved appearance and corrosion resistance are bonus qualities.

Three stainless steel springs are used in the Class 1900 machine. Two are flat diaphragm springs and one a ribbon coil spring. The diaphragm springs are the ribbon support and ribbon guides, below and above the inked ribbon through which the Addressograph plates make their impression.

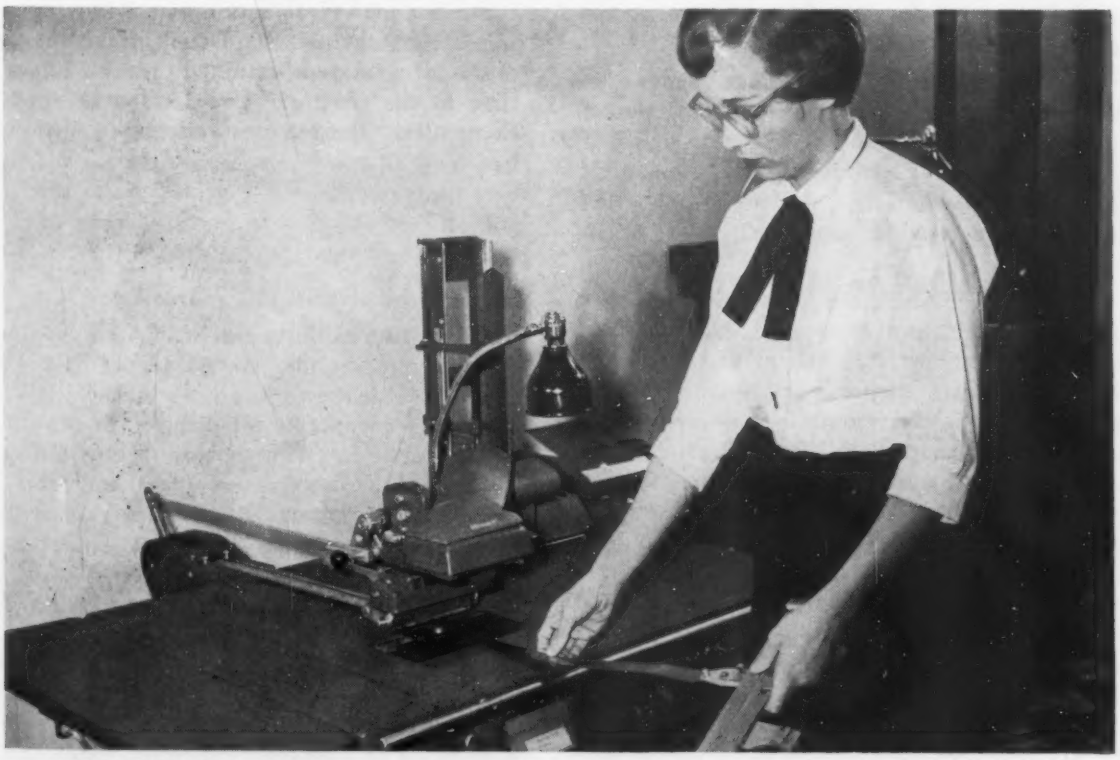
These springs hold the ribbon between them, keeping it flat, in proper position, and clear of the paper. Both flex as the plate presses the ribbon against the paper through the cutout sections of the springs. The machine operates as fast as 120 impressions a minute.

The ribbon coil spring or flexible lister band advances the paper past the point at which impressions are made as it coils up at the back of the machine. Fingers which can extend through holes in the band control the advance. Hole spacing determining impression spacing.

Originally, special imported spring steels were used for this application. This was an expensive material, and was hard to get during the war. A number of domestic spring steels were tried. After extensive experimentation, the material found best for these springs was a standard 301 stainless steel. It is furnished as cold-rolled strip with No. 2 mill finish, in gages from 0.006 to 0.008 in. thick.



DIAPHRAGM SPRING of type 301 stainless steel must flex 120 times per min in operation.



STAINLESS RIBBON spring is inserted between stainless diaphragm springs. This coiled flexible spring advances paper past point where impressions are made on addressing machine.

Simple, compact, flexible—

New System Cuts Waste

◆ Lower costs for waste pickle liquor disposal are possible with a newly developed waste disposal system . . . Operating costs range from 1.8 to 2.0 cents per gallon of waste liquor depending on acid strength and cost of neutralizing agent.

◆ Sludge lagoons are eliminated with this relatively simple system . . . Liquids are acceptable to natural streams and sewers . . . Solids are filtered out and can be hauled away . . . Process can be applied to disposal of small or large quantities of waste pickle liquor.

D. A. Dahlstrom
Director of Research and Development
The Eimco Corp.
Chicago

◆ WASTE PICKLE LIQUOR disposal costs have been cut with a recently developed disposal system which combines simplified processing, compact design, and operating flexibility. The system, applicable to steel and metalworking plants, provides an effluent acceptable to natural streams and sewers.

Neutralized pickle liquor sludge lagoons or the direct disposal to rivers, lakes, abandoned mines, have been solutions to the disposal problem. However, pollution legislation, high cost and unavailability of land for sludge lagoons have worked against use of these methods.

A low cost method, the A. O. Smith-Eimco process devised and in use at A. O. Smith Corp., Milwaukee, treats the problem strictly as one of waste disposal. Low initial and operating costs, compact size, flexibility of operation, technical simplicity and production of legal effluents are achieved. A unit capable of handling 30,000 gal of pickle liquor per day, costs $56,425 for all equipment, buildings and installation.

Flow sheet for the neutralization and disposal of spent acid by this process is shown in the drawing. Pickle liquor from batch or continuous pickle tubs is fed to a waste acid holding tank. The acid is in turn continuously fed to a reactor tank designed for a controlled retention period. Milk of lime is fed at a constant rate to the reactor and the resultant slurry is agitated at high speed. Compressed air is admitted to increase oxidation rate of ferrous salts to the easier filtered ferric state.

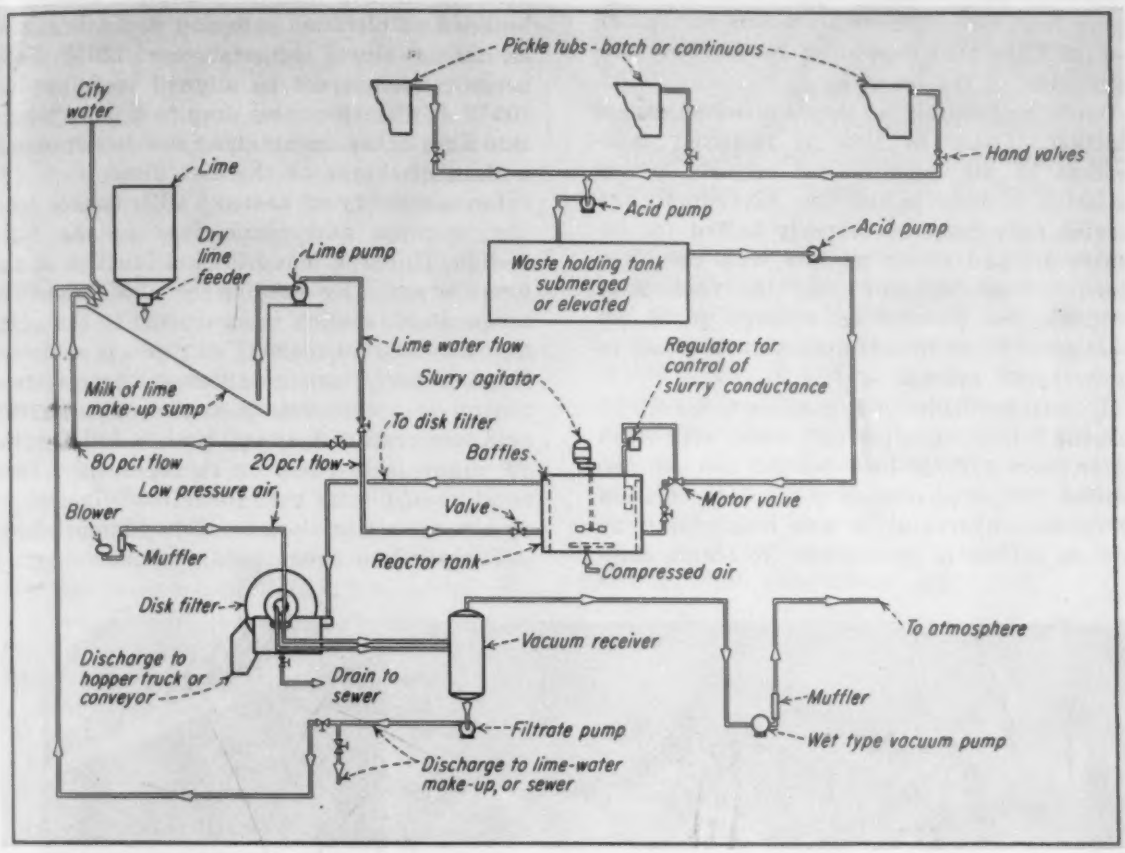
The degree of neutralization in the reactor is regulated by a conductance meter. This meter controls a motor valve on the acid line to maintain a constant pH. Oxidation of ferrous salts to the ferric state is obtained through retention time in the reactor. Usual retention time is 15 minutes. The slurry continuously overflows to a disk filter where it is dewatered to a moisture content of 50 to 60 weight pct in the filter cake. These solids are easily handled and are stable enough for trucking long distances.

Neutralized within 15 minutes

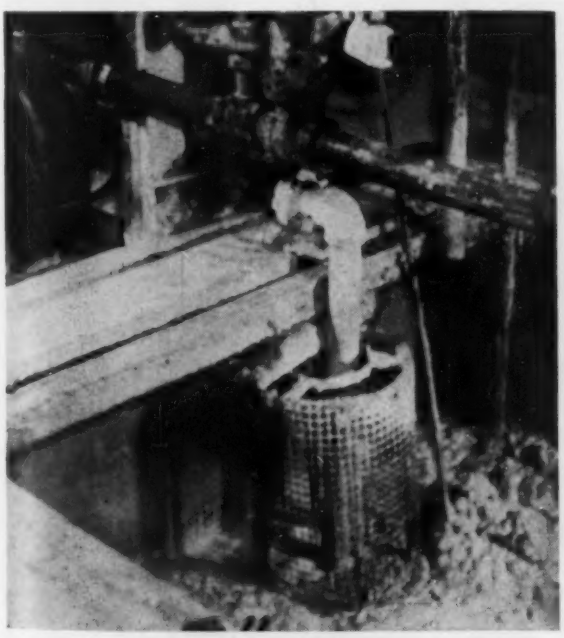
The filtrate exhibits a pH of 7.5 and contains no suspended solids. About 80 pct of the filtrate is returned to the lime slaker with the remainder acceptable for disposal to sewers or natural streams. The disposal plant with its lime make-up sump, reactor tank and filter installation will handle 30,000 gal per 16-hr day.

In this continuous neutralization process, complete neutralization can be obtained in less than 15 min. By introduction of air into the slurry partial oxidation of the iron to the ferric state is accomplished in a relatively short time. From 2 to 5 pct of the iron is oxidized in 5 to 15 minutes. A 50 pct oxidation will require 30 minutes to 2 hours. Filtration rates at the 2 to 5 pct oxidation level are equivalent to rates at the 50 pct oxidation level.

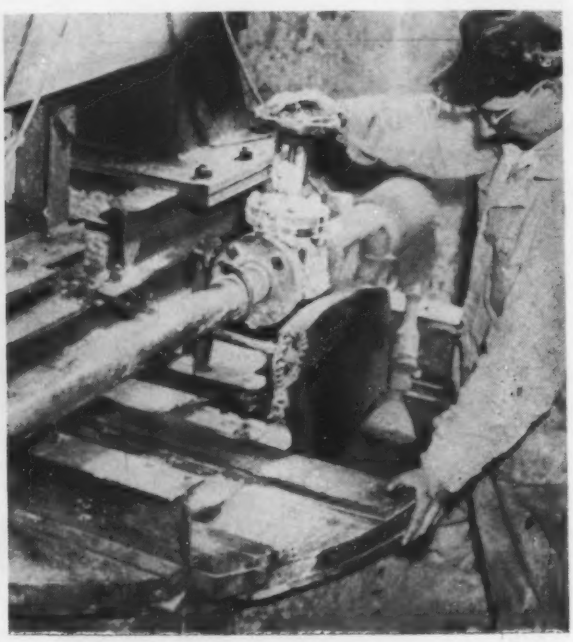
Pickle Liquor Disposal Costs



FLOW SHEET of the A. O. Smith-Eimco waste disposal process. This general flow arrangement can be used for waste pickle liquor from all types of acid pickling operations.



LIME WATER MAKEUP tank uses about 80 pct of the filtrate for more efficiency.



REACTOR TANK is automatically controlled for neutralization and oxidation of waste.

As temperature rises, filtration rate increases . . . Alkaline agent only chemical cost . . .

At the 5 pct oxidation level, filter cake rates range from 8 to 30 lb of dry solids per square foot of filter area depending on the iron concentration of the spent acid.

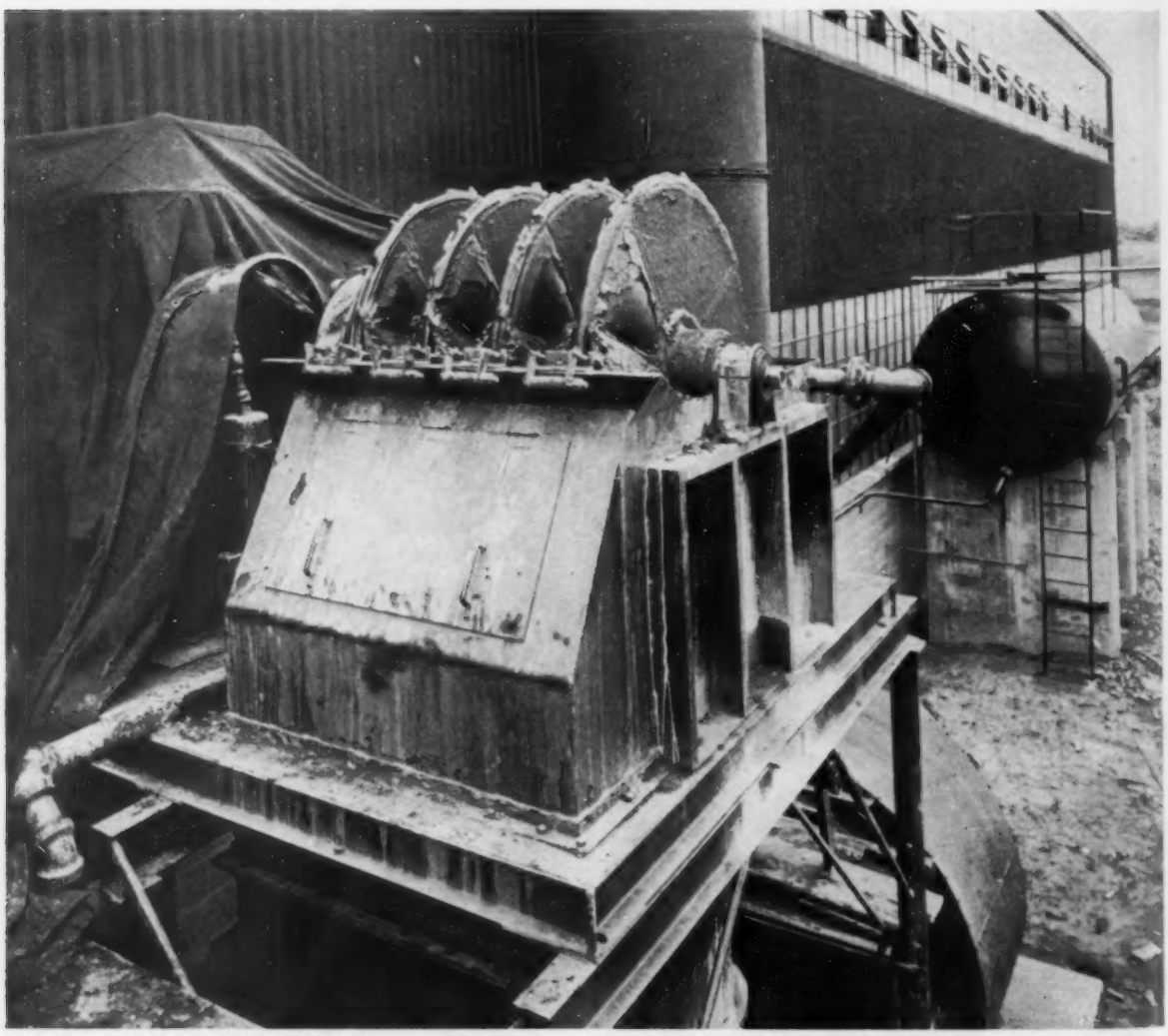
Oxidation probably involves a dissolved oxygen reaction. Oxidation time is relatively independent of air quantity but requires proper agitation to disperse the air. Accordingly the reactor tank must be properly baffled for intimate air and slurry mixture with the high-speed turbine agitator. By the continuous neutralization process an average of 98 pct reaction of input lime is obtained, resulting in a filtrate pH average of 7.5.

By reusing filtrate, it is possible to slake and suspend 3 lb of lime per gal, while with fresh water, only 2 lb of lime per gal can be suspended. This is attributed to the deflocculation of calcium hydroxide in the lime slurry by calcium sulfate in the filtrate. To obtain complete lime reaction and an optimum pumping slurry, it is necessary to maintain a maximum lime concentration of 2½ lb per gal of water.

Temperature level influences the filtration operation. As the temperature increases, filtration rate increases. This causes a decrease in filter media life due to blinding. Best combination of filtration rate and media life is at an average slurry temperature of 120°F. Temperature should not be allowed to fall below 105°F as filtration rates drop to a point where thin filter cakes are obtained and do not permit a clean discharge on the disk filter.

Low solubility of heated $CaSO_4$ causes scaling of pipes and connections in the filter station. This was found to be a function of the temperature. By holding to 120°F average temperature, scaling is minimized to the point where an annual reaming of pipes is sufficient for good performance. Automatic temperature control is not necessary as the operator can hold temperature between 105° to 140°F without appreciable effect on the operation. Temperature of filtrate used for milk-of-lime make-up also assists in close control of temperature.

The alkaline agent used for neutralization



DISK FILTER DEWATERS sludge to 50 pct concentration for easier handling by conveyor or truck.

is the only chemical cost. Average basicity values of common alkaline agents whose price per ton would allow consideration for this process are listed in the table. Basicity value is defined as equivalent CaO per gram of material.

High calcium quicklime sold on the basis of available CaO is comparable in price to all but carbide lime. Except for certain installations where carbide lime is available the high calcium quicklime exhibits lowest overall cost and best operation.

Carbide lime, a by-product of acetylene manufacture from calcium carbide, exhibits substantially the same results as high calcium quicklime. While only about 80 pct as effective as high calcium quicklime, compared on a cost per ton basis it is a far more economical neutralizer if readily available in the area.

Carbide lime can be obtained in two forms, "as is" consisting of hydrated lime settled to a 50 pct solid, or as a water suspension of 25 to 35 pct solid. The latter eliminates certain handling equipment but is more expensive in haulage costs. This is uneconomical compared with high calcium quicklime if transported over 30 miles. The 50 pct solids carbide lime is economical where more than 40,000 gal per month are being neutralized. Carbide lime can be purchased f.o.b. for approximately $3.00 per dry ton.

Neutralizing agent costs compared

Hydrated lime and dolomitic hydrated lime are similar in results to the unslaked varieties. But because of higher cost they are generally less desirable.

Caustic soda and soda ash give a very high reaction rate and less solids. However, neutralization agent expense may be as much as ten times greater than lime. High calcium limestone is effective only in batch lots for small acid quantities and long retention periods.

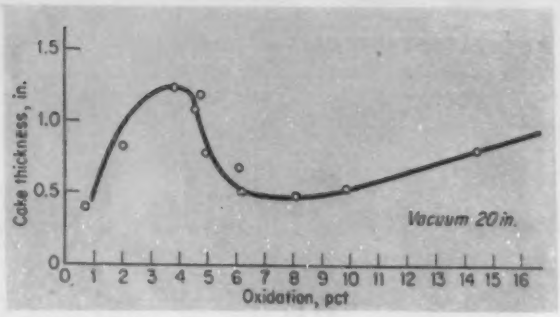
Most pickling operations use sulfuric acid. However, a number of installations use various amounts of nitric, hydrochloric and hydrofluoric acid. Results with reaction rates are about the same as with sulfuric acid. A recent installation on waste pickle liquor from a mixture of nitric and hydrofluoric acid used like amounts of lime. Only two changes are necessary for these acids. If nitric or hydrochloric acid are present, a pH meter must be used for control instead of the conductivity meter.

Operating costs for the process are indicated in the box. All costs have been considered including overhead, cake disposal, amortization and site rental. All costs are liberal and may be lowered depending upon area, chemical costs and plant design. For example, cake disposal costs represents 42 pct of total expense. This is due largely to a 22 mile round trip haulage which can be reduced in many cases.

Substantial reductions in direct labor charges can and are being made because of recent developments in plant layout. Complete disposal costs will range from 1.5 to 2.0 cents per gallon of waste liquor depending primarily on acid strength and neutralizing agent cost.

ACKNOWLEDGMENTS

The author wishes to thank the A. O. Smith Corp., Milwaukee, for data used in this article, and Lorenz W. Heise and Milton Johnson, co-inventors of the process, and to R. O. Hawkes of the Elmco Corp.



FILTER CAKE THICKNESS as a function of oxidation level was tested at A. O. Smith Corp.

BASICITY OF NEUTRALIZERS

AGENT	BASICITY FACTOR†
Dolomite Quicklime	1.110
High Calcium Quicklime	0.941
Dolomite Hydrated Lime	0.912
Hydrated or Carbide Lime	0.700
Caustic Soda, Flake, 76 pct	0.687
Dolomite Limestone	0.564
Soda Ash, Dense, 56 pct	0.507
High Calcium Limestone	0.489

† Grams of equivalent CaO per gram of material.

DISPOSAL PLANT OPERATING COSTS*

	Cost per Week	Cost per 1000 Gal
DIRECT LABOR, SUPERVISION, OVERHEAD 2½ operators at $3.50 per hr including insurance.	$ 700.00	$ 4.67
NEUTRALIZING AGENT Carbide Lime — 75 Dry tons at $3.00 per ton plus $2.00 per ton for cartage.	375.00	2.50
FILTER CAKE DISPOSAL Haulage at $750.00 per 100 loads. Dumping permit $400.00 per month.	1,150.00	7.66
POWER CONSUMPTION 65 hp at $0.01 per kw-hr	38.60	0.26
MAINTENANCE Filter bags plus parts and labor.	150.00	1.00
LIME HANDLING One loader at $211.00 per month, rental plus gasoline.	49.00	.33
BUILDING AND EQUIPMENT	230.00	1.53
MISCELLANEOUS Water, Heat, Telephone, Lights.	50.00	.33
TOTAL	$2,742.60	$18.28

*30,000 gal waste per 16-hr day.

Eccentric sample—

Simple Test Measures Quenching Power of Salt Baths

By R. F. Harvey
Chief Metallurgist
Brown & Sharpe Mfg. Co.
Providence

◆ An eccentric hardenability test specimen is the basis of a new method for determining the effects of various degrees of agitation on the characteristics of hot salt baths . . . Specimens are easy to prepare, simple to use and test results can be evaluated in practical terms.

◆ Five hardness readings are taken at the periphery of the specimen in 1/8-in. increments of thickness . . . Hardnesses are plotted against section thicknesses . . . By using specimens of the same steel austenitized under identical conditions, the quenching power of various salt baths can be compared by determining surface hardnesses at the peripheries of the specimens.

◆ HOT SALT QUENCHING is widely used, but an important variable, agitation of the quench, is often disregarded. To investigate this and other aspects of hot quenching, a new method of evaluating quenching power has been developed. It involves the use of an eccentric hardenability test specimen which can be made quickly and inexpensively. Results obtained are easily evaluated in practical terms.

To gain all the advantages of interrupted quench hardening, to minimize internal stresses and distortion, and to avoid cracking, it is necessary that quenching power be adequate to assure desired hardness. Optimum mechanical properties in the quenched and tempered condition are obtained only with a fully martensitic structure.

Best results with hot quenching are obtained when the hardenability of the steel is adequate to produce martensite, and the quenching power of the bath is sufficiently high to insure a martensitic structure. Even a poor quench may give satisfactory results with highly alloyed steels which delay the start of transformation at elevated temperatures and permit decreased cooling velocities. However, such extravagant use of critical alloys is not desirable.

Agitation in interrupted quench hardening, first designated as step quenching and later martempering or marquenching, was first developed and brought under scientific control for hardening hacksaws.[1] Agitation has a very pronounced effect on other standard quenching mediums such as oil or brine.

The H value, i. e., the quenching power, for violently agitated oil is about 0.95 or about three and one half times that of still oil. The H value for violently agitated brine is about 5.0 and is about two and one half times that of still brine.[2] The quenching power of still

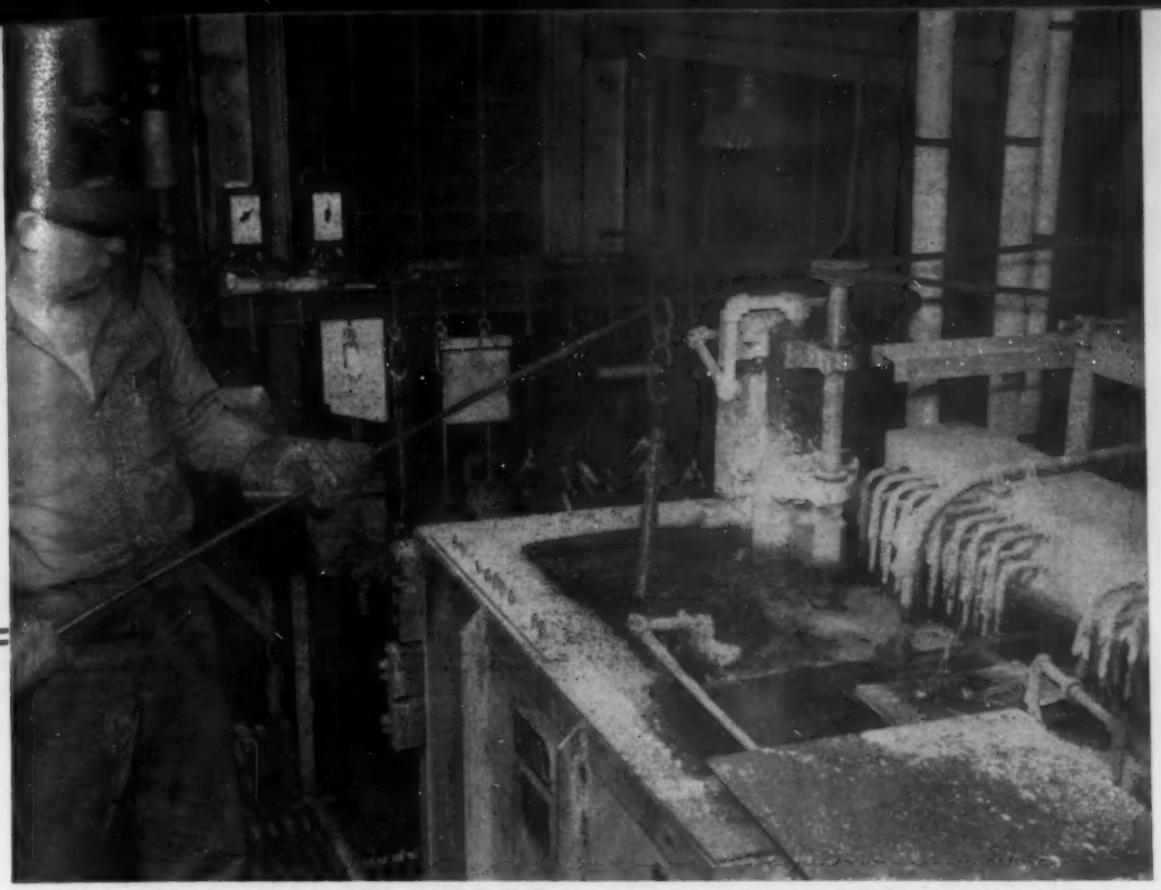


Fig. 3—Quenching is done in a 12-in. diam header agitated by a variable speed propeller.

salt was similarly increased by several hundred percent by proper agitation.

No method previously used to measure the quenching power of molten salt baths was entirely suitable for this investigation. In one investigation[3] a stepped cylinder of 0.51 pct carbon tool steel was used. Such a cylinder would have to be relatively long for an adequate range of diameters. This may cause errors due to variations in the depth of the bath. Also, sectioning is required to determine center hardness which is used as the criterion of quenching power. Added moisture lowers the operating temperature of molten salt baths and increases the quenching power.[4]

Air cooling a problem

Jominy-type end quenching, using molten salt as the quenching medium has also been investigated.[5] Violent but highly localized agitation on end quenching does not adequately represent conditions of actual practice. During the cooling time of about 30 min which is necessary for bringing specimens from the austenitizing temperature to 400°F, the effects of air cooling are believed to be appreciable and compensation for them is difficult. Also, pumping molten salt through the end-quench apparatus may cause mechanical difficulties.

Some investigators have used cone-shaped specimens[6] to show differences in various quenching mediums. However, such specimens are difficult to use because sectioning and etch-

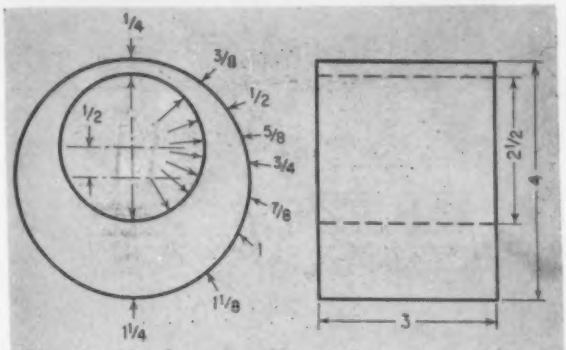


Fig. 1—Hardness readings taken at periphery of eccentric hardenability test specimens are used to compare quenching power of salt baths.

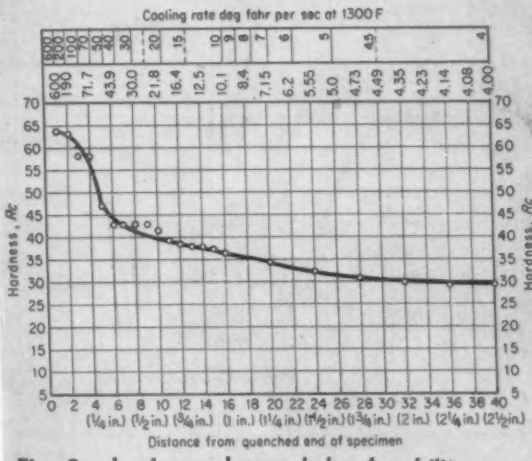


Fig. 2—Jominy end-quench hardenability curve for AISI 52100 steel serves as comparison for cooling rates of various eccentric specimens.

An eccentric type hardenability specimen can be easily prepared to test agitation effects . . .

ing are necessary, and special fixtures required to determine axial hardness.

An eccentric-type hardenability specimen, shown in Fig. 1, can be easily prepared and is simple to use in determining the effect of various degrees of agitation.[7] It is easily machined by turning and drilling to sections varying in thickness from ¼ to 1¼ in.

An average of five hardness readings are taken at the periphery in increments of ⅛ in. of thickness. This is done midway along the length to eliminate end effects. The Rockwell C hardness is plotted against section thickness as measured radially from the center of the 2½-in. diam hole. Using specimens of the same steel austenitized under identical conditions, the quenching power of various salt baths can be compared by determining the surface hardnesses at the peripheries of the specimens.

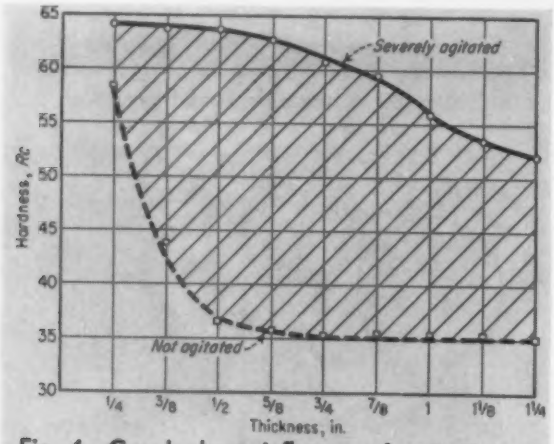


Fig. 4—Graph shows influence of agitation on hardenability of AISI 52100 steel specimens.

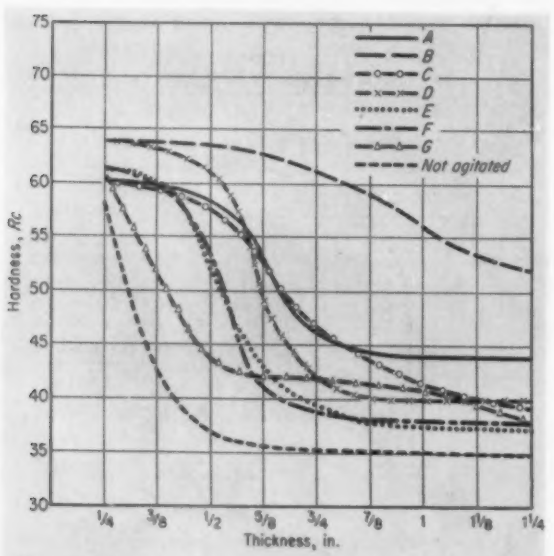


Fig. 5—Hardness readings show results of tests at seven commercial plant installations.

The diameter and other dimensions of the specimen may be varied for other thicknesses, if desired. The section thickness, as measured radially from the center of the 2½-in. hole, is an arbitrary dimension. A section measured in that way is not exactly equivalent to the normal measurement of thickness of a flat plate, but it is comparatively close for practical purposes.

Standard end quenching used

A chrome-bearing steel, AISI 52100, was used because it is an analysis commonly hot-salt quenched in commercial practice. It also has sufficiently low hardenability so that the specimen readily reflects differences in bath conditions. The steel used is 4½-in. round hot-rolled barstock containing 1.10 pct C, 0.39 Mn, 0.013 P, 0.019 S, 0.23 Si, and 1.49 Cr.

The standard Jominy end-quench hardenability of this steel is plotted in Fig. 2. To obtain these data, a piece of the barstock was normalized at 1650°F for 2 hr. After normalizing, a Jominy specimen was machined midway from the center to the periphery. It was then heated for quenching in an atmosphere furnace at 1550°F for 45 min. End quenching was done in the standard manner, using cold brine.

Held in bath 5 minutes

All eccentric-type specimens used were heated for hardening in a neutral salt bath consisting of chlorides of barium, sodium, and potassium at 1550°F for 30 min. All salt-quenched specimens were quenched immediately, with the axis of the hole held vertically into a nitrite salt bath at 400°F. After holding in the quench bath for 5 min, specimens were cooled to room temperature in air.

One of two commercial hot-salt quenching installations used in the investigation at Brown & Sharpe Mfg. Co., Providence, is the three-bath unit in Fig. 3. It includes a carburizing salt normally operated at 1700°F, a neutral salt usually operated at 1550°F, and a quench salt normally operated at 400°F. The quenching salt is a ternary mixture of about 53 pct potassium nitrate, 40 pct sodium nitrite and about 7 pct sodium nitrate. A propeller rotating at 1750 rpm provides agitation for the header-type quench. A separating chamber in the quenching tank filters out chlorides carried over from the neutral salt bath.

Only neutral and quenching salt baths are used for treating AISI 52100 steel. To evaluate general commercial quenching practice, specimens from the same heat of steel were hardened at the Brown & Sharpe plant and six other

commercial installations. Maximum agitation was used in each instance. The treatment was identical in every case, the principal variable being in agitation.

Hardness was plotted against thickness in the two hardenability-type curves in Fig. 4, using severe agitation and no agitation. The curves represent extreme conditions with salt quenching. One curve represents severe agitation with a header-type quench using a propeller speed of 1750 rpm and the other curve represents no agitation with a still quench.

Approximate cooling rates at 1300°F in degrees Fahrenheit per second for various sections were calculated for various quenching conditions. They are calculated from end-quench tests on the same steel and based on the principle that the cooling rates at the surface of the eccentric specimen are the same as the cooling rates at that location on the Jominy end-quench specimen which has the same hardness.

Plot results of agitation

The AISI 52100 steel, ½ in. thick as measured on the eccentric specimen, will harden to 63½ Rc with severe agitation. At 1/16 in from the quenched end of the Jominy specimen, the hardness is also 63½ Rc, corresponding to a cooling rate of about 600°F per sec. Similarly, AISI 52100 steel at ½ in. thickness with no agitation was only 37 Rc. This corresponds in hardness to a point on the Jominy hardenability curve in Fig. 2 at 15/16 in. from the quenched end where the cooling rate is only about 11°F per sec.

Hardnesses obtained at seven different plants are shown in Fig. 5. Curves include extreme conditions of severe agitation and no agitation.

Brine quenching is the most powerful quench. It was included for comparative purposes only since brine is not generally used in AISI 52100 steel except for very large sections. This is due to the probability of severe distortion and cracking. Mildly agitated oil at 120°F was a more powerful quench than the least efficient of the hot-salt quenches but was less powerful than the severely agitated hot-salt quench.

Quenching characteristics of commercial baths varied considerably in quenching effectiveness. This was probably due to differences in agitation in the various installations.

Plants A and B used very similar quenching methods insofar as propeller speeds, and header arrangements were concerned. However, plant B had a more effective quench. It appears that a copious flow of salt is not necessarily a powerful quench. Turbulence or mixing currents are believed to be more effective. This may account for some differences in the various installations. Other factors which adversely affect hardness in salt-bath heat treating are decarburization in the neutral salt and decreased quenching power of the nitrite salt due to chloride contamination.

A high degree of agitation is desirable for quenching relatively large sections, but too much agitation should not be used on thin sections. Very severe distortion has occurred with high rates of agitation in hot quenching small sections of carburized AISI 4620 steel. With a less severe quench, distortion was eliminated and the results were satisfactory.

In determining the optimum degree of agitation for each application, the cooling rate should be sufficiently high to obtain a fully martensitic structure in the size and analysis treated. However, the cooling rate should not be much greater otherwise excessive distortion and even cracking may result. A propeller driven by a variable-speed motor permits agitation over a broad range to accommodate a variety of parts.

Shortages of critical alloys and more exacting commercial requirements demand better heat-treating techniques and equipment. Hot-salt quenching permits hardening of a wide variety of parts with less internal stress, less distortion, and without cracking. Good agitation, more than any other single factor, should increase the quenching power of commercial salt quenches.

The eccentric hardenability specimen used in the test can be produced quickly and inexpensively. Results are easily evaluated in terms of practical knowledge. It can also be used to determine hardenability under actual conditions of interrupted quench hardening.

For such an evaluation, a standard reproducible, trouble-free quench is required. These conditions can be met by quenching into hot salt at 400°F without any agitation. While this is not as powerful as the agitated quenches, it is reproducible. For evaluating different steel compositions, this method gives practical information.

References

[1] Hardening Steel, U.S. Pat. Appl. No. 320,998, R. F. Harvey, Feb. 27, 1940.

[2] Metals Handbook, ASM, 1948, p. 495.

[3] "Variations in the Quenching Power of Salt Baths," A. M. White, Metal Progress, Dec., 1949.

[4] "Water in Molten Salt Increases Quenching Power, Lowers Operating Temperature," E. N. Case and A. M. White, Metal Progress, Oct., 1953.

[5] "Analysis of Hardenability Under Marquenching Conditions," C. M. Carman, D. F. Armiento and H. Markus, ASM Preprint No. 7W.

[6] "Hardenability of Shallow Hardening Steels," C. B. Post, O. V. Greene and W. H. Fenstermacher, ASM Transactions, Vol. 30, 1942, pp. 1202-1247.

[7] Discussion of Ref. 5, R. F. Harvey.

Atomized oil—

MIST LUBRICATION
Cuts Maintenance, Production Costs

By W. E. Drayton
Chief Tool Engineer
Wright Mfg. Div.
American Chain & Cable Co.
Reading, Pa.

◆ Marked savings in lubricant costs have been achieved at American Chain & Cable Co.'s Reading, Pa. plant through the use of mist-type lubrication units . . . For added benefits, units spray oil-kerosene mixture on grinding wheels, increase wheel life four to six times . . . Other installations lubricate boring mills and multiple spindle drills to reduce bearing failures.

◆ Fine oil spray helps prevent coolant-lubricant contamination on screw machines . . . Mist lubrication on a 300-ft conveyor decreased frequent stoppages and shutdowns for linkage take-up . . . Oil consumption on machines with these units is now measured in ounces per day instead of gallons.

◆ MACHINE TOOL DOWNTIME, maintenance manhours and lubricant costs have been greatly reduced by extensive use of mist-type oil lubrication at the Reading, Pa., plant of American Chain & Cable Co. Installation of these units on tool grinders has substantially increased wheel life. Similar units attached to boring mills, multiple spindle drills and screw machines have materially reduced bearing failures and coolant contamination. Oil consumption per machine is now measured in ounces instead of gallons.

On two diamond wheel carbide tool grinders, daily application of a few ounces of an oil-kerosene mist to the wheel surfaces has extended wheel life an average of six times.

One of these grinders uses two 6-in. diamond cup wheels for servicing single point carbide tip tools. Before installing the Alemite Oil-Mist lubricating system, wheel life averaged about two months. After six months' use of a mixture of kerosene and No. 10 weight oil on the grinding surfaces, the two wheels were estimated to have reached approximately half-life. Current replacement cost is $184 per wheel. Four to five ounces of the lubricant mixture are used per day.

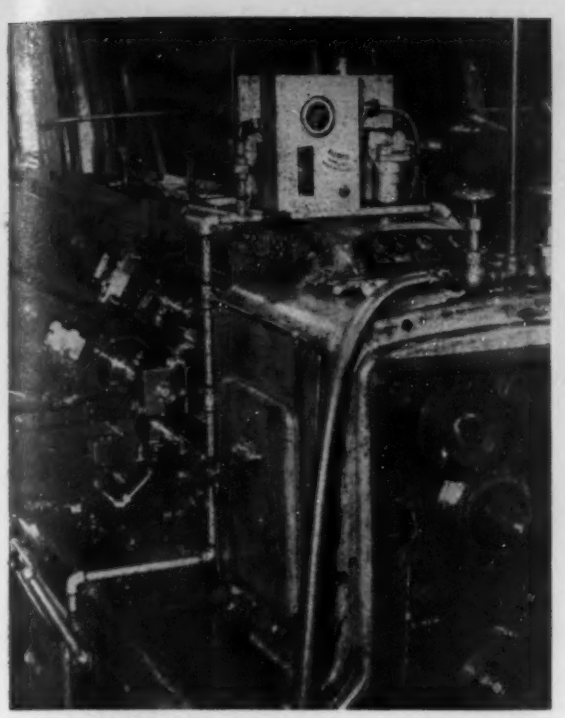
The second grinder formerly used three wheels per year at a replacement cost of $197 per wheel. With mist application, wheel life will increase from four to approximately 14 months. Oil mixture consumed amounts to less than two ounces daily.

Ground workpieces have a smoother finish, and use of the atomized oil-kerosene mixture has eliminated wheel dressing. Wheels do not load up and the mess and bother of wick lubrication is avoided.

Another savings example is a 42-in. boring mill which formerly required daily lubrication at 30 points. Some points needed attention three times per shift since oil cups were quickly exhausted when the machine was operating. Mist-type lubrication has eliminated these time-consuming, production wasting interruptions.

Two of the new lubricating units are mounted on the rear of the mill, each serving one side of the machine. Only attention required is a daily filling of the 12-oz oil reservoir in each unit. This can be done any time during the shift without stopping operation since oil consumption per shift is less than half the reservoir capacity. The operator does not turn on the lubricating units; a solenoid does this automatically whenever the machine is started.

As a result of experience on the 42-in. mill,



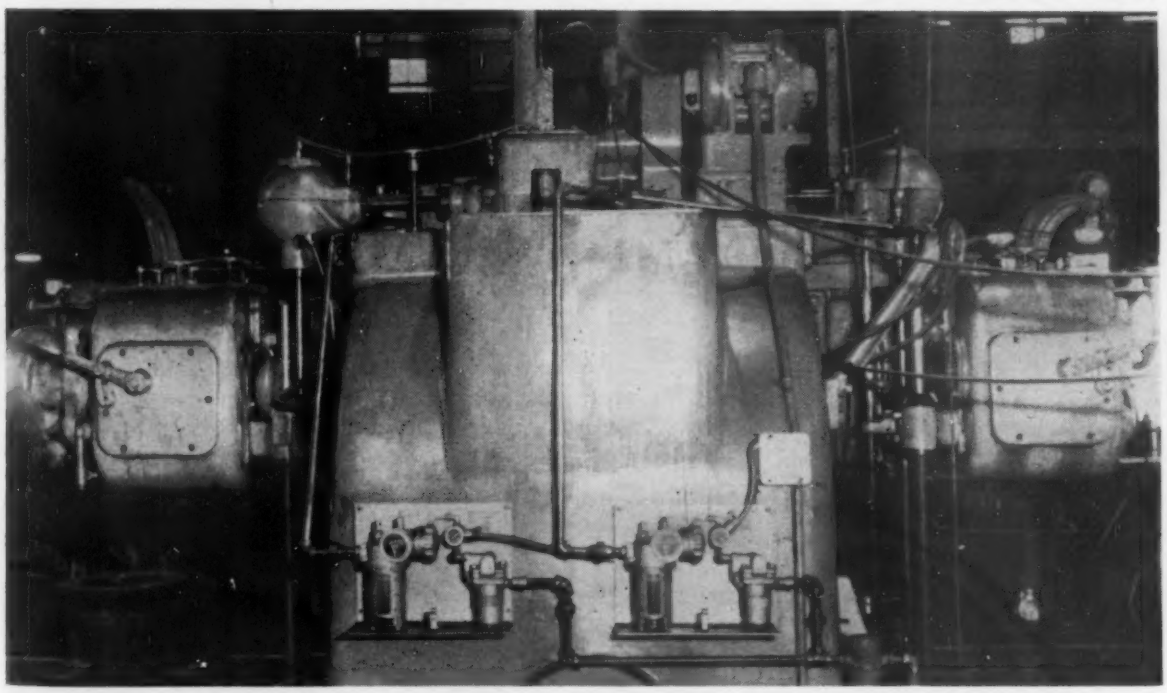
OIL-MIST UNITS on 7 screw machines saved an estimated $5800 overall in the first year.

MULTIPLE SPINDLE DRILL, mist lubricated, uses 20 gal of oil yearly; it formerly used 250.

all 13 boring mills in the plant, ranging in size from 24 in. to 100 in., are to be equipped with these lubricating units. Only exception will be the conical main table bearing, which is pressure lubricated by pump in sump.

Four multiple spindle drills, operating 16 hours per day, are now being lubricated with 20 gal of finely atomized oil per year, as against 250 gal required with former lubrication methods. A mist of oil is continuously applied when the machines are in operation. With no downtime required for lubrication, about 250 hours of machine time are gained per year. Downtime formerly was 20 min every 16 hours.

The lubricator units have eliminated all drippage onto nearby work and floor areas. They are mounted at eye-level height on the machines and the finely dispersed oil particles are carried to all critical points by pipe, flexible hose or copper tubing. Elimination of lad-



BORING MILL is mist lubricated at 30 points with two units operated by a solenoid switch.

Finely dispersed oil particles are carried to all critical points . . .

ders for lubricating upper bearings has added an important safety factor to these installations.

Twin burdens of oil costs and bearing replacements have also been virtually eliminated in the company's screw machine department. This is indicated by more than two years' experience with mist-type lubrication on seven of these machines.

Contamination of cutting oil and lubricating oil on these screw machines was also expensive in terms of bearing failures, oil replacement, downtime, etc. Various types of seals and coolant combinations were tried, but spindle bearings continued to go out in from three to six months, and there was excessive wear on shaft bearings.

In an effort to prolong bearing life and eliminate coolant-lubricant contamination, a 1-in. machine was lubricated with a fine oil mist and close record was kept for three months. Results were so satisfactory that the entire bank of seven machines was similarly equipped.

A daily report on all seven screw machines was kept for 12 months. Here is the score for downtime, oil consumption and maintenance costs:

1. Lubricating oil consumption has been reduced from 5400 gal per year to about 120 gal per year. Net savings: $2375.

2. The cost of "downtime payable," (labor costs wasted during downtime for machine repairs) decreased 96 pct.

3. Between 900 and 1000 production machine hours were gained, due to elimination of frequent bearing failures.

4. Reduction in maintenance costs, including cost of new gears or bearings, was approximately $3000.

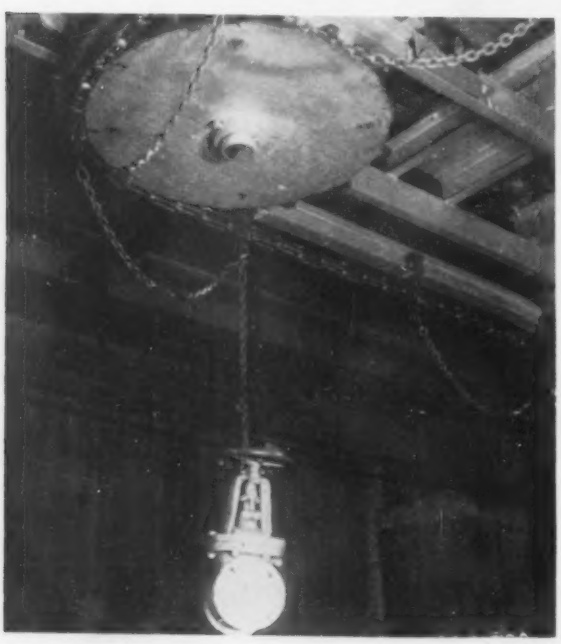
Total savings as a result of equipping these seven machines with Alemite Oil-Mist units is estimated at slightly more than $5800 in the 12-month period. Maintenance costs in the second year of operation are expected to be about 70 pct under the first year's charges, basing this estimate on condition of the bearings at the end of the 12-month study.

Application of 1½ oz of oil through an atomizing orifice once every 8 hours has also eliminated excessive maintenance on a 300-ft conveyor used to carry valves and fittings. Frequent jammings no longer occur, and linkage take-up is not required as often.

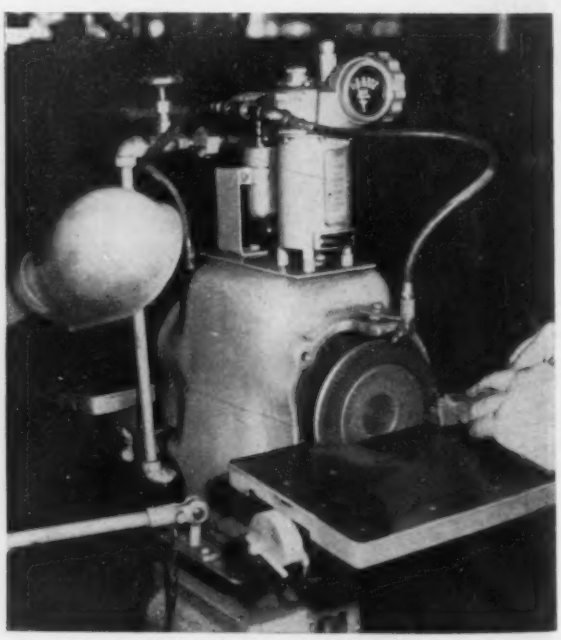
See reduced maintenance

Prior to installation of the mist-type lubrication system, a heavy oil was brushed onto the wheels and linkage every three or four months. The power drive and sprocket shaft had grease fittings but the wheels did not. The chain was not lubricated nor was the sprocket wheel rim on which it rode past the power drive. Wear on these parts was severe, and linkage take-up was a frequent requirement. After seven months of fine mist lubrication to all moving parts, total linkage take-up has been only ½ in.

Housekeeping has also improved to a marked degree. When oil was formerly brushed on, the entire conveyor route was spotted by oil-drippings.



CONVEYOR is mist-lubricated at critical points to eliminate jamming and save linkage take-up.



GRINDING WHEELS last 4 to 6 times longer with daily use of oil-kerosene mist.

Insulation:

Device aids in finding economical material thickness.

Finding the thickness of insulating material required on heated industrial equipment has been simplified with an ingenious scale recently developed.

Standard thicknesses for various operating temperatures may be adopted for company-wide use, avoiding the need for reconsideration of specifications on each new job or, the cost of insulating materials and installation may be weighed against the cost of heat loss to obtain the most economical insulation thickness under expected operating conditions and equipment life.

How To Save On Fuel

The designer usually finds that the standard thicknesses are satisfactory when the cost of heat in a new installation is about equal to that on which previous jobs have been based.

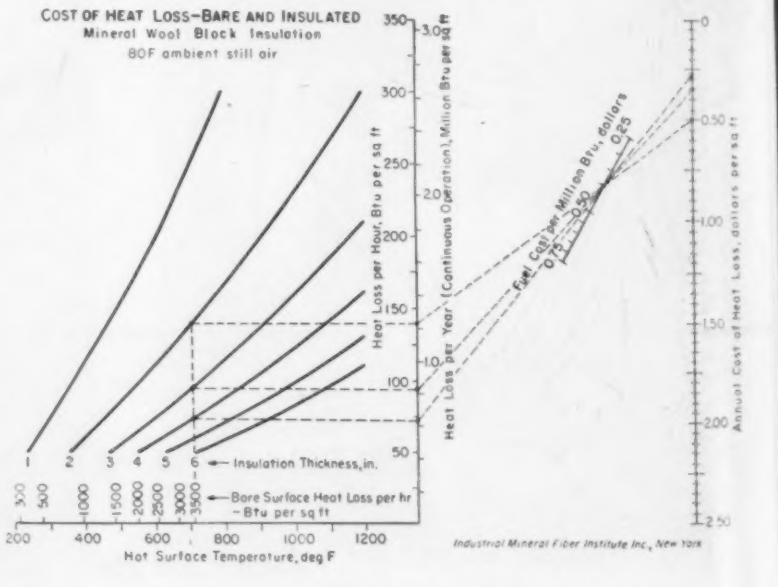
However, when the cost of heat is unusually high or low or when a job is particularly large, a closer investigation of the most economical insulation thickness is certainly justified by the resulting savings in fuel dollars.

Fewer Calculations

The heat-loss graph has been designed to help the engineer and specifier in determining the most economical thickness of mineral wool block or board insulation in specific cases, without requiring repeated calculations.

Hot-surface temperature and fuel cost per million Btu are fixed by the application, while the required data on materials and installation costs are obtained from insulation contractors or manufacturers.

To use the graph, start at hot-surface temperature on the scale



Graph helps find required insulation thickness . . .

IF YOU WANT MORE DATA

You may secure additional information on any item briefed in this section by using the reply card on page 119. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

at the lower left and proceed vertically to the given block or board insulation thickness on the curves at left. A horizontal line through this point intersects the vertical scale in the center at both heat loss per hour in Btu per sq ft and heat loss per year in million Btu per sq ft for continuous operation.

Annual heat loss may be adjusted proportionately when operation is not continuous. Follow with a line through heat loss on the center scale and through cost per million Btu on the slanted scale to meet the righthand scale at the approximate annual cost of heat loss in dollars per sq ft.

Finds Heat Loss Also

For each particular insulating job, hot-surface temperature and the cost of heat are constant, so that insulation thickness only can be varied (presuming that the type of insulation and finish remains the same). The engineer then selects two or three reasonable insulation thicknesses and determines with the graph the corresponding annual cost of heat loss with each.

Knowing the difference in total installation cost between the various thicknesses, the specific operating cycle and the company's depreciation rate, the engineer can determine the most economical insulation thickness. Of course, the graph can be used to determine heat loss alone, from both bare and insulated surfaces.

Here's An Example

Assume an engineer wants to determine the most economical thickness of mineral wool block insulation for an industrial oven operating continuously at 710 F and at a fuel cost of 40¢ per million Btu.

By applying the graph (as shown by the dotted lines) he obtains and tabulates the heat-loss costs for tentative insulation thicknesses or 2 in., 3 in., and 4 in.

Added cost (materials and la-

Turn Page

Factors other than material and installation costs must be considered . . .

bor) is then tabulated to provide 3 in. or 4 in. as compared to 2 in. It is assumed that 3-in.-thick insulation costs 26¢ more per sq ft when installed than 2-in.-thick mineral wool blocks; 4 in. costs 54¢ more per sq ft than 2 in.

COST COMPARISONS

Insulation Thickness in.	Annual Cost of Heat Loss* $ per sq ft	Annual Heat Savings Over 2 in. Thickness $ per sq ft	Added Material and Installation Cost (approx.) Compared to 2 in. Thickness $ per sq ft
2	0.50	....	....
3	0.35	0.15	0.26
4	0.27	0.23	0.54

* From graph.

How Costs Work Out

It is evident that 3 in. is a more economical thickness than 2 in., if the oven will be in use 2 years or longer. A thickness increase to 4 in. saves 23¢ more per sq ft each year but costs 54¢ more to install initially than 2 in.

The added 2 in. of insulation (4 in. vs. 2 in.) would take less than 3 years to pay for itself at the assumed fuel cost of 40¢ per million Btu. Thus, selection of insulation thickness would be governed by the anticipated operating life of the oven.

Note Bare Surface Loss

From the bare-surface heat loss scale at the lower left of the graph, it is noted that the bare loss at 710°F is about 3500 Btu per sq ft per hr (at 80°F ambient). At the same fuel cost, the annual cost of heat loss (without insulation) would be about $22 per sq ft.

It may be necessary to consider factors other than material and installation costs in determining economic insulation thickness. However, the costs of materials and installation are almost always far more important.

Turn Page


Introducing
WEIRKOTE
a new tight-coated galvanized steel
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Now—from Weirton's completely new mill—comes Weirkote, a better galvanized steel with a tight protective coating that doesn't crack, flake or peel under even the most difficult fabricating operations.
Weirkote's zinc coating stays uniform, flows evenly with the base metal, holds fast under most rugged treatment. It holds because the oxidized iron-zinc layer commonly found in galvanized steel is eliminated from Weirkote by the modern continuous galvanizing process by which it is made.
You'll find your products easier and cheaper to produce . . . more durable, better looking . . . if you make them with Weirkote. Get the facts today from your Weirton representative, or write Weirton Steel Company, Weirton, West Virginia.
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For better products
Weirkote is available in coils and cut lengths: gauges 16 to 30 inclusive. Maximum width—42", maximum cut length—168". Weirkote can be obtained to fit any customer requirement. For standard roofing and siding it is guaranteed to conform to A.S.T.M. specification A361-52T.
WEIRTON STEEL COMPANY
Weirton, West Virginia
NATIONAL STEEL CORPORATION

RECOMMENDED THICKNESSES

Minimum Thickness — Mineral Wool	
Temperature, deg F	Thickness—In.
up to 200	1
200–400	1½
400–500	2
500–600	2½
600–700	3
700–900	3½
900–1100	4
1100–1300	4½
1300–1500	5
1500–1600	5½

Because of the several assumptions made, the graph cannot be expected to be more accurate than ± 15 per cent although most results (with reasonable thicknesses of insulation) will be quite close to actual values. When the graph is used on a comparative basis, of course, greater accuracy may be expected.

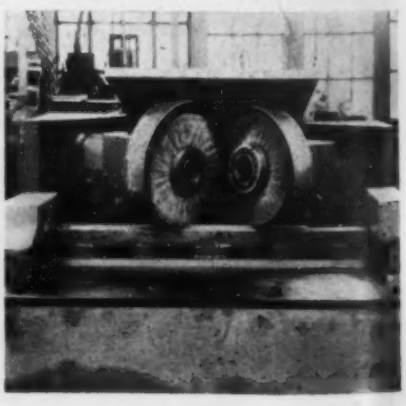
Wire Brushing:

Speeds deburring, blending of gear rack edges.

A new mass production brushing method for deburring and blending surface junctures and surface irregularities of gear racks is resulting in production increases of more than 500 pct for American Type Founders, Inc.

Designed and developed by American Type Founders engineers, with the cooperation of The Osborn Mfg. Company, to deburr 17 ft gear racks, the new method, utilizing power brushes, has cut deburring and finishing time from 50 minutes per unit to less than 10 minutes.

The set-up provides a completely automatic, gear driven sequence for



Here's the setup . . .

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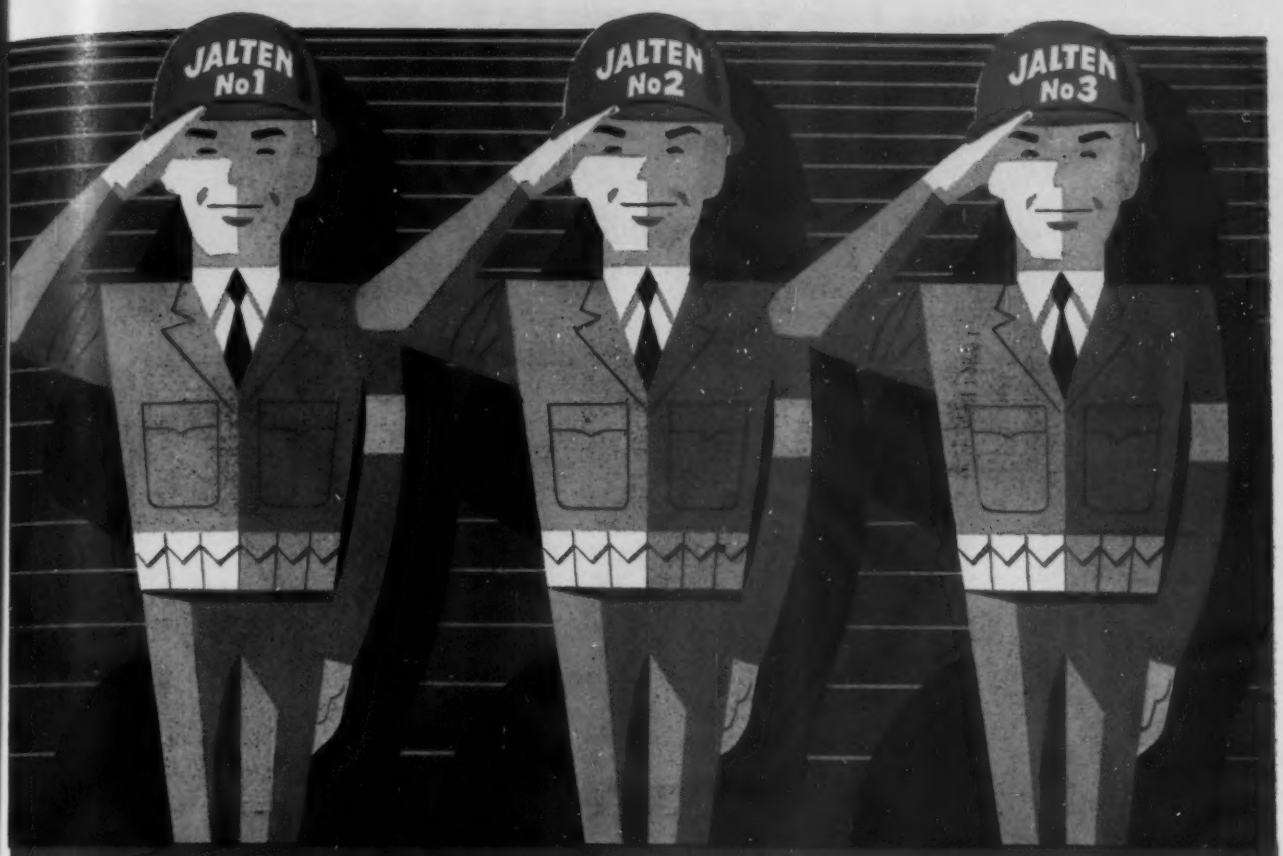

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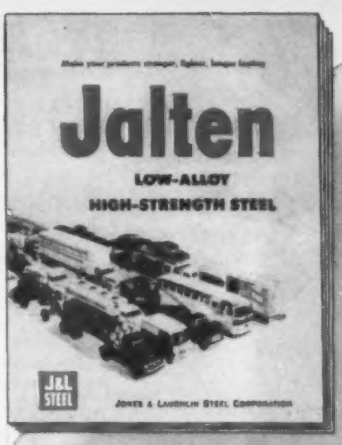
THEY'RE ALL JALTEN!

J&L's New JALTEN series enables you to select low-alloy, high-strength steel in the following combinations of advantages:

JALTEN No. 1 — High strength, good formability and fabricating —good resistance to low temperature impact.

JALTEN No. 2 — High strength, moderate forming—improved resistance to atmospheric corrosion.

JALTEN No. 3 — High strength—improved resistance to abrasion.



The data you want is in this book:

- Chemical Properties of Jalten
- Mechanical Properties of Jalten
- Jalten Equivalents
- Jalten Application Data

Remember to specify JALTEN High Tensile Steel for

- HIGH STRENGTH • RESISTANCE TO CORROSION
- GOOD FORMABILITY • RESISTANCE TO ABRASION

J&L STEEL

Jones & Laughlin
STEEL CORPORATION — *Pittsburgh*

Jones & Laughlin Steel Corporation
Dept. 403, 3 Gateway Center, Pittsburgh 30, Pa.

Please forward a copy of your booklet, Jalten low-alloy, high-strength steel.

Name_____

Company_____

Address_____

deburring the gear racks at a speed of 5 fpm. When the entire rack has passed beneath the brushing area, a limit switch reverses both the direction of feed and the rotational direction of the brushes finishing the two opposite sides of the gear teeth.

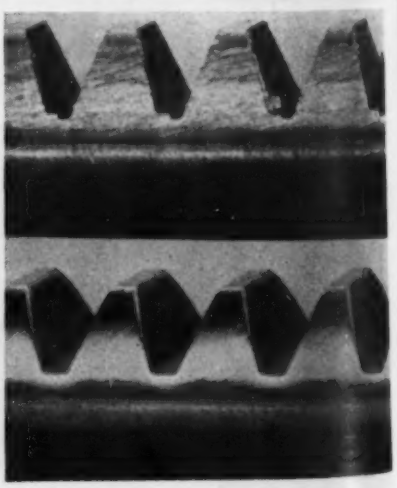
Special fiber fill Fascut brushes manufactured by Osborn were specified. They rotate at 1750 rpm permitting conformation to the irregular contours of the gear teeth. The brushes also do a blending job where surfaces meet. Here they form smooth curves at the junctures in place of fragile sharp edges.

Aids Stress Distribution

Power brushes have been instrumental in helping solve many problems of stress distribution to avoid excessive local concentrations which could cause progressive fracture.

By providing fast, economical,

Brushes act uniformly . . .



Before and after . . .

Turn to Page 171A

Special U-clamps made on a DAKE press with this low-cost fixture

A few pieces of scrap steel, cut to size and welded, became the die with which this machinist forms U-clamps on his Dake Hydraulic Press.

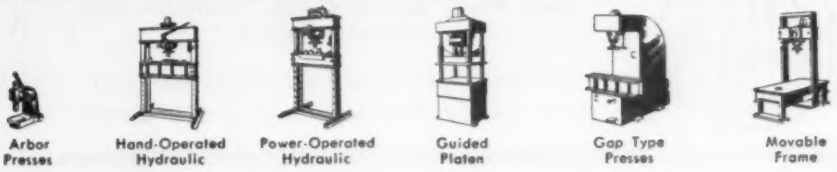
He is Gerald Denicola, who operates the Marmora Machine Co. of Chicago. One of his customers orders these clamps 100 at a time, three or four times a year.

When he learned that there would be repeat orders for them, he rigged up the fixture shown above at a cost of less than $15. It paid for itself on the first run, and since then has paid "dividends" regularly every three or four months.

If you are hammering out jobs the *hard* way, imagine how much work and money you could save by doing them with a Dake Hydraulic Press. Hand, air, or electrically operated Dake Presses with capacities ranging from 25 to 300 tons are suitable for thousands of production and maintenance jobs. They are fully described in illustrated Catalog 129—write for a copy, today.

Dake Engine Company, 602 Seventh St., Grand Haven, Mich.

DAKE PRESSES



and effective production methods and means for producing smooth curves in place of the sharpness of tool and grit marks and surface junctures, power brushes and brushing have become an essential part of modern manufacturing.

Brushes and brushing equipment have become important production tools because they fit into those manufacturing operations where the ratio of labor costs to other production costs is very high, and where least development effort has been placed in the past. Many of the operations which can be done with brushes offer higher than usual rewards in cost savings and improved quality.

Fasteners:

Redesign cuts assembly costs, lengthens life.

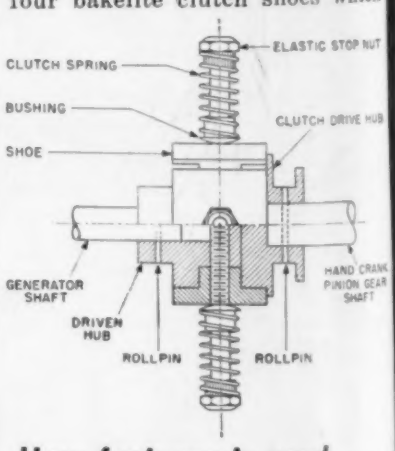
Improved design features, using a simple yet rugged and effective clutch, are being used in a megohmeter made by the Winslow Co., Newark, N. J.

Through use of self-locking nuts, self-retaining pins and substitution of eyelets for screw machine parts, Winslow has lowered manufacturing cost, and improved the performance of the clutch.

Crank to Shaft

The generator is driven by a hand crank, connected by a gear train to a shaft and the clutch drive hub. The driven hub is attached to the generator shaft.

The two hubs are coupled by four bakelite clutch shoes which



How fastener is used . . .

Turn Page

Federalize!

AND YOU'VE MODERNIZED!

The age of the Big Change is here: the propeller is giving way to the jet... precision is giving way to super-precision... the instrument quality controls of yesterday are industrial museum pieces today... motion itself has taken a new name: *speed.*

The America that rolled along on Federal decades ago is a new America, rolling on a new Federal today. The Federal bearing that once smoothed the way for one horsepower has been modernized to do the same job with a 1/10 horsepower.

And change is the order of the day with sources of supply. The purchasing powers across America are taking a new look at the old familiar faces... are re-examining, re-appraising... are learning that yesterday's No. 2 sources of supply are ready to become today's No. 1.

Changing with change... new with the new is Federal. Take a new look at this one of the world's largest ball bearing manufacturers... then specify Federal. *Federalize and—you've modernized.*

Federal Ball Bearings

One of the world's largest ball bearing manufacturers

THE FEDERAL BEARINGS CO., INC.
POUGHKEEPSIE, N. Y.
Producers of the *Modern* ball bearing

ride on four spider studs extending radially outward from the driven hub. The clutch shoes are held against the hub perimeters by compression springs on each stud.

Remain Locked In Position

Winslow uses Elastic Stop nuts as adjustable spring retainers at the ends of the spider studs. These are self-locking nuts of the prevailing torque type, which remain locked at any position on the stud to which they are turned.

They can be moved to adjust spring pressure, but will not loosen the effects of centrifugal force, spring pressure, vibration, wear or other factors.

Use Inexpensive Bushing

In the original design, a machined bushing was used on the stud at each end of the spring. Now, at the shoe end, an inexpensive bushing made on an eyelet machine serves equally well. At the nut end, the need for a bushing has been eliminated by using a clinch type nut.

This is similar to the standard hex nuts formerly used, but the hex nut body has a shank or sleeve-like extension over which the spring end fits. This is a unique application for a nut normally intended for clinching to sheet metal parts.

Hubs Drilled, Tapped

Hubs are drilled and tapped for set screws, which hold them in position while a permanent fastener is inserted. Formerly the fastener used was a taper pin. This was expensive, involving both drilling and reaming, and frequent breakage of expensive reamers.

So Winslow switched to using the Rollpin. These self-retaining pins hold fast in an ordinary production drilled hole. No taper reaming, no peening or other fastening operation, is required.

In the more than 10 years this meter has been on the market, not one clutch failure is known to have occurred, and returns for repairs of any kind are rare.

Turn Page

How Oxygen . . . and LINDE SERVICE*

HELPED A STEEL MILL CUT "CROP LOSS" BY $60,000 A YEAR

SPECIAL PROBLEMS CALL FOR LINDE SERVICE

Time after time—as in this case of cutting high-sulphur steel—oxygen has proved to be the answer to problems that arise in mill operation. But oxygen alone isn't enough. It takes skill and experience in research, engineering, production, and distribution to get the most out of oxygen use. Through LINDE SERVICE you get an unrivaled combination of them all.

The 4" x 4" billets coming from a rolling mill in a large steel plant are 140 feet long. They must be cut to shorter length for transfer to the next mill.

Because the billets are high-sulphur steel, conventional shearing resulted in split ends. More than 100 tons of steel per month were being lost in cropping the defective ends. Production was slowed.

Then LINDE SERVICE stepped in. Working with the mill people, LINDE engineers designed and installed a high-speed oxy-acetylene flame cutting system. Result? No more split ends . . . billets are now cut quickly and cleanly. A production bottleneck was broken. The mill figures it is saving at least $60,000 a year.

If your company uses oxygen, LINDE SERVICE can mean dollar savings to you. Let us tell you more about it.

LINDE AIR PRODUCTS COMPANY

A Division of UNION CARBIDE AND CARBON CORPORATION

30 East 42nd Street UCC New York 17, N. Y.

Offices in Principal Cities

In Canada: Dominion Oxygen Company

Division of UNION CARBIDE CANADA LIMITED

***LINDE SERVICE**

is the unique combination of research, engineering, and over 40 years of accumulated know-how that is helping LINDE customers save money and improve production in their uses of oxygen and oxy-acetylene processes.

Linde Trade-Mark

Vibration:

Units track down frequency, size of machine vibration.

Greater accuracy in determination of machine vibration has been possible with a device now being used by Timken Roller Bearing Co., Canton, Ohio.

The instrument locates abnormal vibrations in a machine without the necessity of dismantling the machine. It makes the job of maintaining very close accuracies in roller bearings a simpler and easier task.

Can Be Carried Around

A portable device, the instrument is used to detect abnormal vibration in the rotating parts of a machine. It is the industrial counterpart of the physician's stethescope. It consists of a vibration pick up, a filtering probe, a stroboscopic lamp, and an electronic instrument that records frequency and amplitude of vibration.

Bearing Accuracy Improved

Advantages of such a tool are readily apparent to the maintenance man. Detecting out of balance parts, formerly a slow tedious task, has been greatly speeded up. Out of balance parts can now be detected while the machine is operating.

Tapered roller bearings are a highly accurate and precise product, going through many grinding operations. As one of the world's largest users of grinding wheels, it is readily apparent that the maintenance of these many grinding machines is of vital importance.

Low Vibration Level

By using the Vibratron in its maintenance program, Timken has been able to maintain an average vibration level on its grinding machines to 0.000090 (ninety millionths of an inch). Accuracy built into a machine, and kept there by careful maintenance, makes possible the production of accurate and precise tapered roller bearings.

How It Is Used

To correct a machine that is out of balance the following steps are taken. First the machine is completely shut down. A reading is then taken with the Vibratron.

Spots machine vibration . . .

Reading will show extent of vibration present in building floor . . .

The probe of the instrument is placed on the spindle, bearing, or housing where it will be used for balancing later.

This reading will show how much vibration is present in the floor of the building upon which the machine is set; how much vibration is transferred to the machine being tested from other machines. This reading will represent the best obtainable after the machine in question is balanced.

Vibration Triggers Light

With the pick up probe still in position, the various parts of the machine are started, one at a time, and the amplitude reading observed after each successive step. This indicates which parts of the machine give the most vibration. The part is double checked with the light which is triggered by the strongest vibration felt by the pick up probe.

From this point on, it is simply a matter of balancing the unbalanced part by replacement or repair until the reading approaches as nearly as possible the reading taken with the machine shut off.

Corrosion:

Improved equipment helps maintain high heat transfer.

A new type coated cooling section and use of Naval bronze rather than steel bolts have solved a corrosion problem where cast iron cooling equipment is continually subjected to raw sea water, High heat transfer efficiency of the original equipment was maintained over a longer period.

Corrosion of cast iron cooling equipment after two to three years in continuous contact with raw sea water at temperatures up to 225°F was found to present a problem serious enough to require preventive measures at American Cyanamid Co.'s plant, Linden, N. J.

After this length of service in cooling sulfuric acid produced in two plant units, there was enough loss of heat transfer efficiency to require more cooling equipment. Also leaks were developing at the joints of the cooling sections as a result largely of corrosion of the steel bolts used for assembly.

Little Corosion On Fins

Since high grade cast iron has proved to be the best available material for the cooling of acid it was believed possible to improve both the life of the cooling sections and their cooling efficiency without changing the cooling water system or treating the water to reduce its corrosive properties.

Internal fins which contribute to the high cooling efficiency of National cooling sections showed almost no corrosion from the flow of acid through them.

Cause of the exceptionally high rate of corrosion is the raw sea

Turn Page

Corrosion builds up heavy scale which reduces rate of heat exchange . . .

water which is taken from the Arthur Kill between Staten Island and the mainland. This water is used for cooling in quantities totaling about 5500 gpm for the two acid production units when its temperature is highest in summer.

Its corrosive action is aggravated by sulfuric acid temperatures as high as 225°F for the entering 98-pct acid. This promotes evaporative cooling which leaves salt deposits on the cooling coils. The water also has a pH of 5.6 to 6 which contributes to its corrosive effects.

Affects Heat Exchange

Corrosion on the water side has been severe enough to build up heavy scale which reduces the rate of heat exchange and promotes the growth of algae. Maintenance and cleaning operations tended to start new leaks. The magnitude of the problem is evident from the volume of water used and the amount of cooling equipment required.

Solution of the problem has been approached in two ways. First was the replacement of steel bolts with bolts of Navy bronze. American Cyanamid engineers in cooperation with those of the Heat Transfer Division of National Radiator Co., Johnstown, Pa., manufacturer of the National cooling sections, are reducing the problem still further by the introduction of a new type coated cooling section.

Two Coolers Used

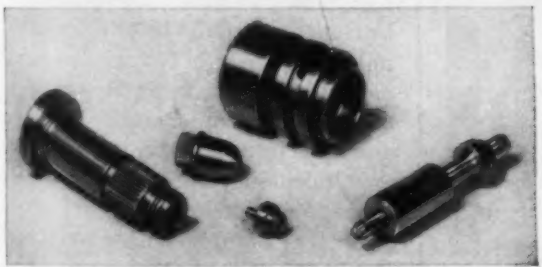
The acid cooling equipment at the Warners plant consists of two coolers, one for the absorber tower and one for the drying tower for each of the two Chemico contact process plants.

The absorber tower cooler handles 98-pct acid from 225° to 170°F and the drying tower cooler

Turn Page

For Atlantic Automatic Co., Cleveland, Ohio:

Tool Life Increased Over 200%!



PARTS FOR GEARS & CAR TRANSMISSIONS are just a few of the many delicate machine tool products Atlantic turns out. Cities Service Chillo Cutting Oil has helped Atlantic maintain their great reputation for quality products.

For the services of a Cities Service Lubrication Engineer... Write Cities Service Oil Company, Sixty Wall Tower, New York City 5, New York.

CITIES SERVICE
QUALITY PETROLEUM PRODUCTS

"Cities Service Chillo Cutting Oil Has Proved To Be The Difference Between Ordinary And Quality Production In Our Shop!"

Here's Atlantic Automatic's story in their own words: "One of our tougher jobs recently was machining SAE 446 Stainless Steel with two forming, one threading and three drilling operations. The critical operation was drilling a .025 inch diameter hole, ⅛ inch deep. The drill would soon pack with chips and break. When a Cities Service Lubrication Engineer was called in, he recommended our using Chillo 44.

"This light-colored oil did the trick. DOWN TIME WAS CUT IN HALF AND DRILL LIFE INCREASED OVER 200%!

"We use Cities Service Chillo 44 to machine all types of metals covering a range of machinability from brass to stainless on our Brown and Sharpe 00G, 0G and 2G Automatics. It has proved to be the difference between ordinary and quality production in our shop!"

—Technical Briefs—

Corrosive action aggravated by sulfuric acid temperature . . .

handles 93-pct acid from 125-130°F to 90-110°F. Cooling water temperatures range from 40°F in winter to 83°F in summer.

In Parallel Banks

In drying tower service one unit cools 550 gpm of 93-pct acid by the use of 27 stacks of ten National cooling sections each, arranged in three parallel banks. Sections, Type AX, are particularly suited to sulfuric acid cooling service, having a minimum wall thickness of ½ in. for high corrosion allowance, are used for all cooling services. Like all National cooling sections, they have internal fins to promote heat transfer.

In the other 93-pct acid coolers 45 parallel-connected stacks of 12 National sections each are used. A total of 810 cooling sections are in use for cooling the end-product acid to its 90-110°F.

Handle 98-pct Acid

The two absorber tower coolers handle 98-pct acid. There are 184 National sections in the smaller unit arranged in 23 parallel-connected stacks of eight sections each. In the other unit 387 National sections are arranged in 45 parallel-connected stacks of 9 sections each.

A total of 571 cooling sections are in use for cooling acid from 225° to 170°F. In both units some of the 98-pct acid goes to storage after further cooling from 170° to 90-110°F in separate banks using a total of 48 National cooling sections.

Sprayed Over Stacks

In all of the cooling equipment the acid flows through the stacks of coils from bottom to top so that the cooling acid flows countercurrent to the direction of the water which is sprayed over the top of the stacks.

Turn Page

IT'S NEW | AND INFORMATIVE TO AID YOU!

Learn how Cooper-Bessemer compressors can cut your costs!

THE new Cooper-Bessemer M-Line Bulletin offers you complete information on economically meeting compressor requirements from 100 to 5000 horsepower. This interesting 44-page booklet simply and fully explains how and why Cooper-Bessemer compressors assure you maximum trouble-free performance at minimum operating expense.

Additional bulletin features include complete data on design, lubrication, automatic controls, cylinders, motor and drives, specifications and photographs of various compressor installations. Cooper-Bessemers offer you new, unusual plus features that are paying off in job after job. To find out about them, send for your M-Line Bulletin today.

MOUNT VERNON, OHIO
COOPER-BESSEMER
GROVE CITY, PENNA.

New York City • Seattle, Wash. • Bradford, Pa. • Chicago, Ill. Houston, Dallas, Greggton, Pampa and Odessa, Texas Washington, D. C. • Shreveport, La. • San Francisco, Los Angeles, Calif. • St. Louis, Mo. • Gloucester, Mass. • New Orleans, La. • Tulsa, Okla. • Cooper-Bessemer of Canada Ltd., Edmonton, Alberta—Halifax, Nova Scotia.

THE COOPER-BESSEMER CORPORATION 2
Mount Vernon, Ohio

Please send me Bulletin M-70 on Cooper-Bessemer M-Line Compressors.

Name ..... Title.....
Company .....
Street Address .....
City ..... Zone ..... State .....

Aluminum powder in plastic vehicle applied to castings . . .

As previously indicated, corrosion of the cooling sections is being reduced by the use of coated National sections. This coating, known as Kolmetal, is a mixture of 85 per cent aluminum powder by volume in a plastic vehicle.

Foundry Operation

It is applied immediately after the cast sections are removed from the molds in the National Radiator Co. plant. At this time the surface has no trace of oxidation or scale and is in condition for a permanent bond.

These coated cooling sections have been placed experimentally alongside uncoated cooling sections in both production units at the American Cyanamid plant for the cooling of acid from its highest temperature. One bank of 64 Kolmetal coated sections, which has more than one year's service, shows practically no traces of corrosion or of algae.

Diemaking:

Part of die for tube reducer weighs 8400 lb.

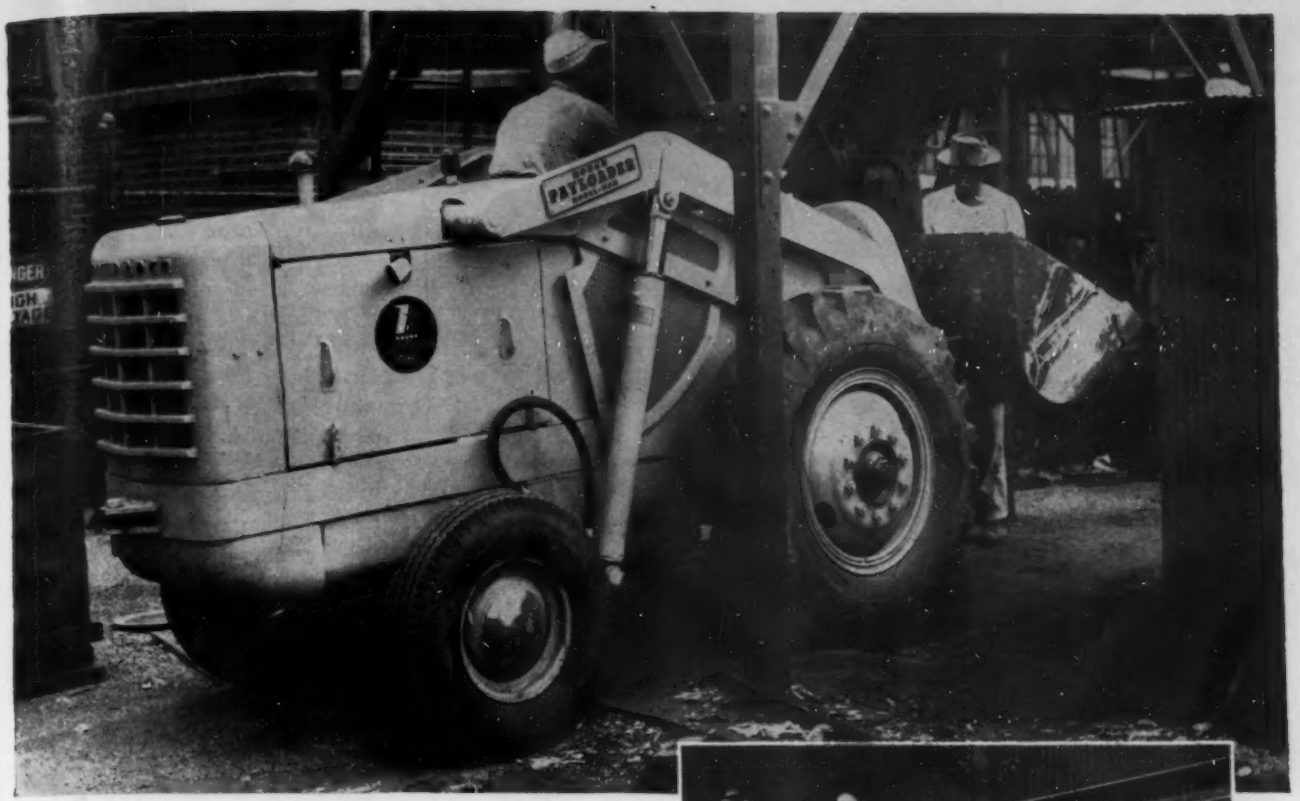
A die section 50 in. in diam and weighing 8400 lb, machined recently on a vertical boring mill at Midvale Co., Philadelphia, will soon be used in a new giant tube reducer. The big tube reducing machine will go into operation early this summer at Tube Reducing Corp., Wallington, N. J.

The new tube reducer is one of a pair of giant-sized machines that will make available for the first time cold finished compression-formed precision tubing from 5½ to 17 in. OD.

Started With Ingot

Processing of the die at the Midvale plant began with a chrome moly roll steel ingot weighing 38,600 lb. An upset disk was forged weighing approximately 20,000 lb

Turn Page



One-ton dust pan

"PAYLOADER" tractor-shovels pay dividends umpty eleven ways handling bulk, loose materials in all kinds of industries. One of the most interesting is at this foundry and machine shop. The "PAYLOADER" positions its bucket under the hopper of the dust collector, the gate is opened and a ton or more of dust flows quickly into the bucket through a canvas boot — a clean, dust-free operation.

Scooping, shoveling, digging, carrying, spreading and all sorts of lifting, loading, unloading and hauling jobs both indoors and outdoors are "PAYLOADER" duties in thousands of plants. Multiple speeds in both directions, short-turning ability and easy-handling enable them to work fast in close, awkward places.

It will pay you to find out how modern "PAYLOADERS" can improve your output and simplify your material-handling problems. The Frank G. Hough Co., 733 Sunnyside Ave., Libertyville, Illinois.

Bentonite and other bagged materials are quickly carried from boxcar and stacked. Hydraulic power gives precise bucket control.

JOB STUDIES are available, illustrating and describing operations in several different plants. These helpful, authorized studies can be secured on request, without obligation.

YOU CAN'T COMPETE IF YOUR EQUIPMENT IS OBSOLETE

SAY "HUFF"

PAYLOADER®

THE FRANK G. HOUGH CO. • Since 1920

and rough machined. Then the groove, as shown in the picture was rough turned to minimum diameters.

The die was then split longitudinally into two sections each weighing 8400 lb and shipped to Tube Reducing Corp. for final machining. Finished die has a 31-in. die face width and a 50-in. diam.

The die section shown is one part of a die unit as used in the tube reducer's compression forming process. A complete die unit consists of two of these sections inserted in heavy steel rolls 50 in. in diam. Each roll with bearings will weigh approximately 60,000 lb.

In the compression forming process, these rolls rock back and forth over the longitudinal axis of a tube positioned between them. The tube is fitted with a polished mandrel that controls the inside finish, size and contour as the rolls compress the inside wall of the tubing around the mandrel.

Tolerances Close

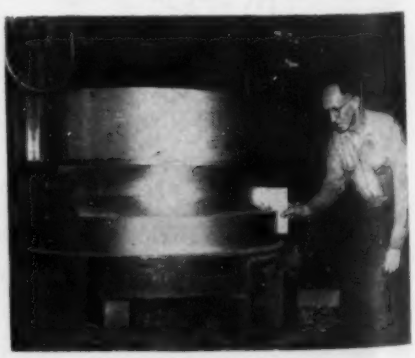
This method of cold finishing tubes produces seamless tubing to closer tolerances, higher finish and a wider variety of inside contours than are usually obtained by conventional methods of cold drawing.

The process was developed by Tube Reducing Corp. in 1937. Until now, this type of tubing was available only in sizes from ⅞ to 5½ in. OD. The new giant tube reducers will extend the available sizes to 17 in OD. and to 0.125 in. in wall thicknesses.

Part of Navy Project

The big tube reducers are the major machines of a $10½ million industrial facility sponsored by the U. S. Navy Bureau of Aeronautics.

The large tubing will be used for manufacturing military and civilian items. Commercially the tubing will be used for aircraft parts and general purpose large-sized hydraulic cylinders, accumulators, casings and ring-shaped products that require high strength thin-walled tubing.



Die diameter 50 in. . . .

the Iron Age
FOUNDED 1855
Markets and Prices

THE IRON AGE SUMMARY...

- No big second quarter shot in arm from autos
- Scrap prices edge up for third week in a row
- Ingot rate steadies at 68 pct of capacity

The steel industry shouldn't look for any big second quarter shot in the arm from auto buying. Both General Motors and Ford have actually been increasing steel inventories while distancing the automotive field in production. Both (but especially GM) have been doing some extra buying as a hedge against a possible steel strike.

If the steel labor contract is negotiated peacefully, this advance buying could deepen the cuts in steel buying auto companies usually make in the summer.

Steel industry earnings were 38 pct higher in 1953 than they were in 1952, according to THE IRON AGE Financial Analysis of the industry.

Although the industry shattered virtually every sales and production record in the book during 1953, net profit was second best to 1950.

THE IRON AGE Financial Analysis includes 29 reporting companies representing 93 pct of the industry's steelmaking capacity.

These companies reported record sales in 1953 of $12.3 billion; sales of the entire industry are estimated at over $13.2 billion.

Net income in 1953 was more than 4 pct below the 1950 record, despite the fact that sales were about a third greater. Three out of four reporting companies had better earnings in 1950.

Competition forced steel companies to (1) absorb freight, (2) trim extra charges, and (3) eliminate premium prices where they existed.

A major producer estimates that freight absorption alone cost him an average of 72¢ per ton in fourth quarter. If this were typical of the entire industry it would amount to about $13 million on the basis of fourth quarter shipments, or well over $50 million on an annual basis. Practice of freight absorption has increased since fourth quarter of 1953.

Although the market picture has been disappointing so far in 1954, the industry still has these bright spots to contemplate: (1) Excess profits tax expired last Dec. 31, (2) Washington is at least considering a change in the income tax law to base depreciation allowances on replacement rather than original cost, (3) the fight to eliminate taxation of dividends (double taxation) looks more encouraging, and (4) business is expected to take a turn for the better during the second quarter.

The 29 companies set aside $933 million last year for Federal income taxes; industry total is estimated at about $1 billion.

Net income of the industry last year was 5.6 pct of sales compared with 4.9 pct in 1952 when operations were hurt by a 54-day strike.

For the third consecutive week scrap prices edged hopefully upward in the absence of real market strength. THE IRON AGE Steel Scrap Composite this week rose 17¢ a ton to $24.50 per gross ton.

Steelmaking operations this week are estimated at 68.0 pct of rated capacity, down 1 point from last week when operations were 1 point better than anticipated. Steel ingot production index this week is estimated at 101.2 (1947-49-100.)

Steel Output, Operating Rates

	This Week†	Last Week	Month Ago	Year Ago
Net Tons Produced (000 omitted)	1,626	1,648	1,652	2,230
Ingot Production Index (1947—49 = 100)	101.2	102.6	102.8	138.8
District Operating Rates				
Chicago	72.5	75.5*	78.0	106.0
Pittsburgh	73.0	77.0	81.0	98.0
Philadelphia	59.5	59.5	67.0	94.0
Valley	62.0	63.0*	60.0	94.0
West	76.0	71.5*	72.5	104.0
Detroit	70.0	83.0	74.0	108.0
Buffalo	67.5	67.0	63.5	94.0
Cleveland	65.0	57.0	60.5	97.0
Birmingham	77.0	75.5	78.5	101.0
S. Ohio River	75.0	70.0	73.0	86.0
Wheeling	71.0	76.0*	86.0	102.0
St. Louis	62.0	62.5*	43.5	71.0
East	31.0	50.0	40.0	96.0
Aggregate	68.0	69.0*	69.0	99.0

Per cent of capacity for weeks in 1954 is based on annual capacity of 124,330,410 net tons as of Jan. 1, 1954. Per cent of capacity for last year is based on annual capacity of 117,547,470 tons as of Jan. 1, 1953.
* Revised.
† Tentative.

Small Fry... Big Business

Another example of how Carpenter ***Application Engineering Service** *is helping industry cut costs, build sales.*

Mention cowboys and Indians to kids from 3 to 13 and their eyes light up, cap pistols start barking, and the fun is on. The game hasn't changed much or lost its excitement since we were small fry . . . but today it spells big business.

And making novelties like this decorative piece for belts and holsters in multi-million quantities, calls for a fine sense of production know-how and cost control. In this case, the Company wanted to hold down costs by cold forming the impressions in the dies, rather than machining them. This called for a special kind of die steel . . . one that would "take" the master form or hob but would still stand up in the presses under long, punishing runs.

Again, Carpenter was called in, and **A**pplication **E**ngineering **S**ervice went to work. Super Samson, a new steel developed in Carpenter laboratories for just such jobs, was recommended and used. Now the Company reports that Super Samson has saved considerable money in the *making* of the dies . . . and the Super Samson dies are turning out the novelties in big, profitable quantities.

Time and again, industry is finding new ways to save money and improve product sales with the help of Carpenter **A**pplication **E**ngineering **S**ervice . . . a service backed by almost 70 years of leadership in specialty steel development . . . a service that uses imagination to help your shopmen apply steels for best results. **A. E. S.** is yours to profit by when you do business with Carpenter. THE CARPENTER STEEL COMPANY, 121 W. Bern St., Reading, Pa.

Carpenter STEEL — **Tool, Alloy and Stainless Steels**

Pioneering in Improved Tool, Alloy and Stainless Steels Through Continuing Research

Markets at a Glance

Republic Boosts Tube Mill . . . Capacity of Republic Steel's South Chicago seamless tube mill will be increased by almost 70 pct, installation of equipment is expected to be completed by spring 1955. Increasing annual capacity from 186,000 to 312,000 at the Chicago mill will expand service to consumers of oil country and bearing tubing.

Amend Nickel Regulations . . . Business & Defense Services Administration has added amendment No. 1 to BDSA regulation No. 2 to insure that nickel obtained with defense ratings doesn't go for other usage. If nickel isn't used for purpose intended, it must be used for filling other rated and pending orders on rated nickel cancelled to the extent of offsetting the diversion. In case there are no rated orders for which the excess nickel can be used, BDSA must be given written notice. If no instructions are received from BDSA in 10 days, nickel can then be used for any purpose.

Admiral Cuts Prices . . . Full amount of the recent 50 pct excise tax reduction is reflected in the suggested list prices of all Admiral Corp.'s refrigerators, freezers, electric ranges and dehumidifiers. All are reduced by the amount of the tax cut and are effective April 1.

Radio, TV Sales Match '52 . . . Factory production of radio and television sets for the first 2 months of the year fell off from the 1953 high to approximately the same output as in the 1952 period, according to reports of Radio Electronics Television Manufacturers Assn. Two month production for 1954 was 847,504 TV sets and 1,641,213 radios. In the same period of 1953, 1,449,831 TV sets and 2,285,581 radios were built.

Close Three Furnaces . . . U. S. Steel Corp. has shut down No. 2 blast furnace at Youngstown Works for repairs. Two openhearth furnaces at Homestead Works were taken out of production last week.

Build Container Plant . . . U. S. Steel Corp. has begun construction of a new container plant on a 27-acre plot in Pensauken Township, near Camden, N. J. The U. S. Steel Products Div. plant is the corporation's third new plant to be started in the Delaware Valley in 3 years. The plant is designed for production of steel drums and pails for petroleum, paint, food and other industries.

Detroit Steel Stockpiled . . . GM, Ford have been building up their steel inventories despite the excellent rate of production of the last two months. Belief is that both industry leaders are stockpiling as a strike hedge. Other automakers haven't cut inventories very much. One warehouse was said to have about 129,000 tons of steel stored for auto companies or parts producers on Jan. 1. It still has 90,000 tons. This shows that Chrysler divisions and other independents are still heavily loaded.

Chase Adds Stainless . . . Chase Brass & Copper Co. announced that effective Apr. 5 it will merchandise stainless steel in sheet, bar, wire and tube from its 27 warehouses and sales offices.

New Eastern Prices . . . U. S. Steel Corp. has trimmed hot and cold-rolled sheet prices at the Fairless Works to match competitors. Cut was $1 per ton and brings hot-rolled sheet to $3.975 and cold-rolled sheet to $4.825 per 100 lb. Alan Wood Steel Co. followed shortly on hot-rolled. U. S. Steel also announced that production of hot and cold-rolled Cor-Ten and hot-rolled Man-Ten sheets will begin during second quarter. Prices will be $1 per ton higher than at the firm's Pittsburgh mills.

Steel Rate Up In Cleveland . . . Steelmaking operations jumped 8 points last week to an estimated 65 pct as both Republic Steel and Jones & Laughlin put two openhearths back into production. This move, coupled with firmer scrap market tone and reports of increased auto sales, is definitely relieving bearish sentiment in the Cleveland area.

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	4.634	4.634	4.634	4.376
Pig Iron (gross ton)	$56.59	$56.59	$56.59	$55.26
Scrap, No. 1 hvy (gross ton)	$24.50	$24.33	$23.50	$43.92
Nonferrous				
Aluminum, ingot	21.50	21.50	21.50	20.50
Copper, electrolytic	29.875	29.875	29.875	31.50
Lead, St. Louis	13.55	13.30	12.55	12.80
Magnesium, ingot	27.75	27.75	27.75	27.00
Nickel, electrolytic	63.08	63.08	63.08	63.08
Tin, Straits, N. Y.	94.25	95.50	90.00	$1.11
Zinc, E. St. Louis	10.25	10.25	9.25	11.00

Stockpile May Tip Third Round Decision

There's plently of aluminum now but a new emergency would dump civilian users . . . Stockpile now half filled . . . Planners might favor a new aluminum round—By *R. L. Hatscheck.*

The new look in prospect for the national stockpile—resulting from the new White House metals and minerals policy—may be just the impetus needed to tip the scales in favor of another round in government sponsored aluminum expansion. As it now stands, Office of Defense Mobilization is still undecided, after several months of pondering.

Fill Normal Needs

An ODM report to Congress shows potential pig aluminum production at about 1.5 million tons —about twice the 1950 capacity.

Another 100,000 tons or so is expected shortly. A new Reynolds plant in Arkansas is expected to be in full operation in May, producing about 54,000 tons. Anaconda's new plant is expected to be turning out a similar amount this fall.

This means, ODM says, that with no disruption the expanded capacity should now take care of normal defense needs, current stockpiling requirements, and provide aluminum for all civilian demands.

Cut Civilian Use

But, the agency warns, if the country should happen to get into a "more serious difficulty," the domestic economy would be in for real trouble.

Here is how the agency reasons: While the current output is sufficient to take care of the present rate of stockpiling, the aluminum stockpile goal is only about 50 pct complete.

In addition, ODM sees no sign of dropping off in demand for the civilian economy. If anything, signs point to more instead of less use of the white metal for civilian purposes.

This would spell trouble for civilian goods, should all-out mobilization be called for. Present M-Day plans call for a "severe cutback" in availability for civilian use until new potlines could be built and put in operation.

Mobilization officials have been marking time. Decision on another round of aluminum expansion had tentatively been set ahead until Defense Dept. completes a current review of probable military requirements on a long-range basis.

This isn't expected until June or July. Meanwhile, the White House had directed a review of the stockpiling situation with an eye to revising goals upward.

Officials don't say so, but the new policy will definitely have a bearing on decision whether more aluminum capacity is needed.

Lead, Zinc Stronger

This revised stockpile thinking had an immediate effect on the lead and zinc markets, too. Prices started upwards without any hesitation. London and domestic factors helped.

One important item reported in the zinc market is that buying, at least in some cases, seems to be in excess of current requirements. This indicates that the inventory pendulum is on its way back and that some buyers figure they'd better get metal now before it goes up some more.

Of course, there is almost always a buying flurry when prices rise—but with a reversal in smelter stocks and prices as low as they have been, strength is definitely felt as an undertone.

Remelt Ingot Higher

Secondary brass and bronze ingot makers finally arrived at single quotations for their products. One leader in the field held off for about 2 weeks, finally moving up on Apr. 1. Increases are from 1½¢ to 2½¢ per lb.

Most aluminum ingots were advanced about ½¢ per lb last week with producers attributing the boost to higher scrap prices forced by export demand.

A number of smelter copper and brass scrap prices were also raised.

MONTHLY AVERAGE PRICE

The average prices of the major nonferrous metals in March, based on quotations appearing in THE IRON AGE were as follows:

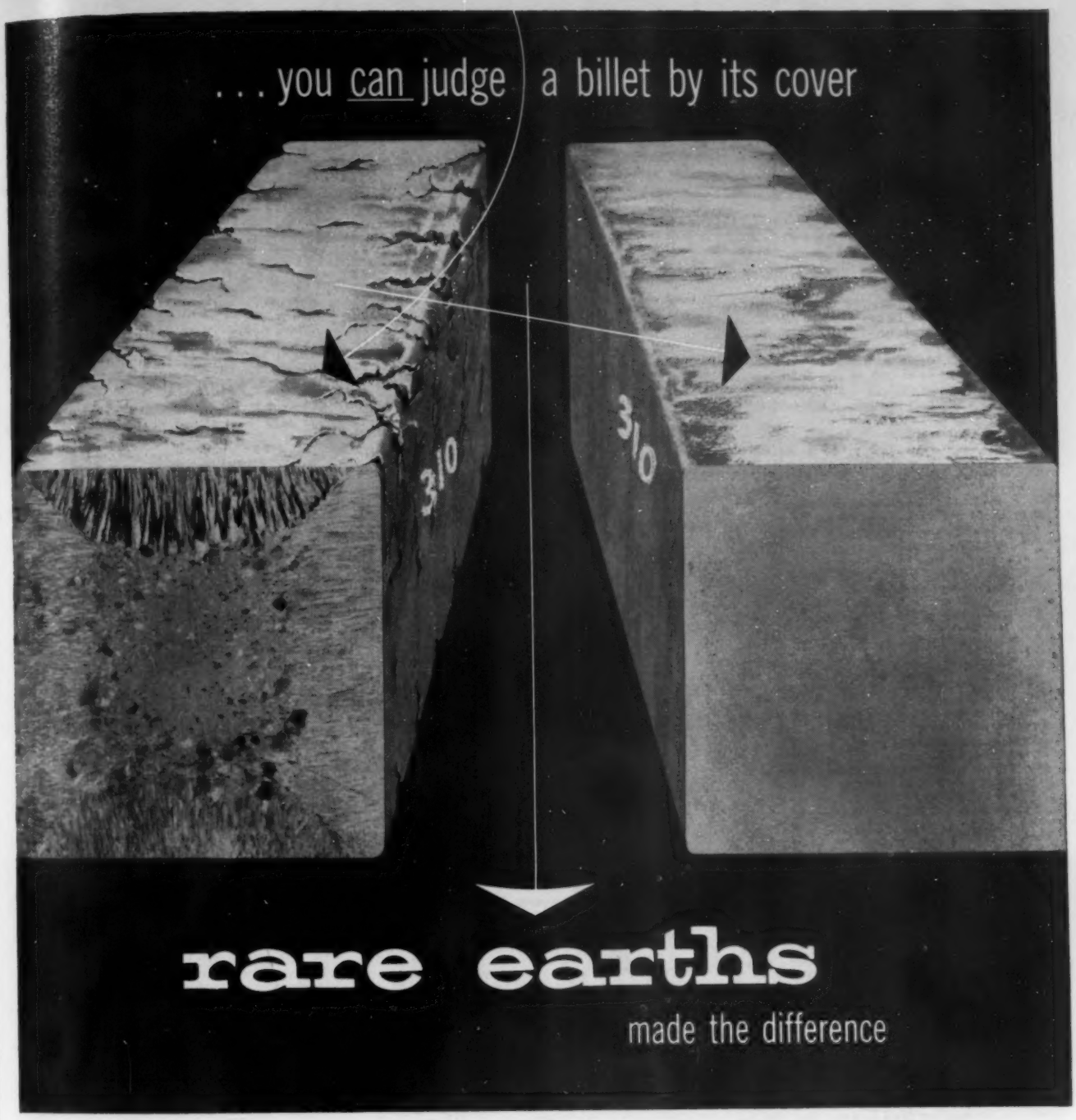
	Cents Per Pound
Electrolytic copper, Conn. Valley	29.866
Lake Copper, delivered	30.00
Straits tin, New York	91.880
Zinc, East St. Louis	9.657
Zinc, New York	10.157
Lead, St. Louis	12.735
Lead, New York	12.935

NONFERROUS METAL PRICES

(Cents per lb except as noted)

	Mar. 31	Apr. 1	Apr. 2	Apr. 3	Apr. 5	Apr. 6
Copper, electro, Conn.	29.75–30.00	29.75–30.00	29.75–30.00	29.75–30.00	29.75–30.00	29.75–30.00
Copper, Lake delivered	30.00	30.00	30.00	30.00	30.00	30.00
Tin, Straits, New York	95.75	95.75	95.00	....	94.25	94.25*
Zinc, East St. Louis	10.25	10.25	10.25	10.25	10.25	10.25
Lead, St. Louis	13.30	13.55	13.55	13.55	13.55	13.55

Note: Quotations are going prices
*Tentative



The two billets shown were produced by a prominent manufacturer of 310 stainless steel. Before rare earth additions, the billet on the left shows a coarse columnar structure, with frequent corner cracks. Heavy cogging was necessary to permit rolling with a minimum of hot tearing; after rolling a grinding loss from the edges incurred additional production time and expense.

Consider the billet on the right, and the great improvement made by a small economical addition of **MCA RareMeT Compound.** The fine primary crystal pattern shown in the sectional view is taken from an unretouched, unmagnified photograph. This steel was rolled without intermittent heating cycles from ingot to billet, and frequently to final size, all with a minimum of hot tearing.

MCA's RareMeT Compound is currently being used successfully in A.I.S.I. grades **309, 310, 316, 317,** and other stainless steel by many progressive producers. *Write today for further information.*

MOLYBDENUM

Grant Building CORPORATION OF AMERICA **Pittsburgh 19, Pa.**

Offices: Pittsburgh, Chicago, Detroit, Los Angeles, New York, San Francisco
Sales Representatives: Edgar L. Fink, Detroit; Brumley-Donaldson Co., Los Angeles, San Francisco
Subsidiary: Cleveland Tungsten, Inc., Cleveland *Plants:* Washington, Pa., York, Pa.

MCA

Nonferrous Prices

(Effective Apr. 6, 1954)

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.136 in. and thicker, 2S, 3S, 33.9¢; 4S, 36.0¢; 52S, 38.2¢; 24S-O, 24S-OAL, 37.0¢; 75S-O, 75S-OAL, 44.7¢; 0.081-in., 2S, 3S, 35.1¢; 4S, 37.7¢; 52S, 39.9¢; 24S-O, 24S-OAL, 38.4¢; 75S-O, 75S-OAL, 46.9¢; 0.032-in., 2S, 3S, 37.0¢; 4S, 41.8¢; 24S-O, 24S-OAL, 46.9¢; 75S-O, 75S-OAL, 58.4¢.

Plate, ¼-in. and Heavier: 2S-F, 3S-F, 32.4¢; 4S-F, 34.5¢; 52S-F, 36.2¢; 61S-O, 35.6¢; 24S-O, 24S-OAL, 36.9¢; 75S-O, 75S-OAL, 44.3¢.

Extruded Solid Shapes: Shape factors 1 to 5, 36.5¢ to 82.8¢; 12 to 14, 37.2¢ to 99.0¢; 24 to 26, 39.9¢ to $1.29; 36 to 38, 47.2¢ to $1.89.

Rod, Rolled: 1.064 to 4.5-in., 2S-F, 3S-F, 43.8¢ to 37.2¢; cold-finished, 0.375 to 3.449-in., 2S-F, 3S-F, 47.6¢ to 39.3¢.

Screw Machine Stock: Rounds, 11S-T3, ½ to 11/32-in., 59.6¢ to 47.0¢; ⅝ to 1½-in., 46.6¢ to 43.8¢; 1 9/16 to 3-in., 42.7¢ to 39.9¢. Base 5000 lb.

Drawn Wire: Coiled 0.051 to 0.374-in., 2S, 44.1¢ to 32.4¢; 52S, 53.4¢ to 39.1¢; 17S-T4, 60.1¢ to 41.8¢; 61S-T4, 53.9¢ to 41.3¢.

Extruded Tubing: Rounds, 63S-T5, OD 1¼ to 2-in., 31.6¢ to 60.7¢; 2 to 4 in., 37.7¢ to 51.1¢; 4 to 6 in., 38.2¢ to 46.6¢; 6 to 9 in., 38.7¢ to 48.8¢.

Roofing Sheet: Flat, per sheet, 0.032-in., 42¾ x 60 in., $2.838; x 96 in., $4.543; x 120 in., $5.680; x 144 in., $6.816. Coiled sheet, per lb, 0.019 in. x 28 in., 30.8¢.

Magnesium

(F.o.b. mill, freight allowed)

Sheet & Plate: FS1-O ¼ in., 56¢; 3/16 in., 57¢; ⅛ in., 60¢; 0.064 in., 73¢; 0.032 in., 94¢. Specification grade higher. Base 30,000 lb.

Extruded Round Rod: M, diam ¼ to 0.311 in., 77¢; ½ to ¾ in., 60.5¢; 1¼ to 1.749 in., 56¢; 2½ to 5 in., 51.5¢. Other alloys higher. Base up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes: Rectangles: M. In weight per ft, for perimeters less than size indicated: 0.10 to 0.11 lb, 3.5 in., 65.3¢; 0.22 to 0.25 lb, 5.9 in., 62.3¢; 0.50 to 0.59 lb, 8.6 in., 59.7¢; 1.8 to 2.59 lb, 19.5 in., 56.8¢; 4 to 6 lb, 28 in., 52¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness: OD, ¼ to 5/16 in., $1.43; 5/16 to ⅜ in., $1.29; ½ to ⅝ in., 96¢; 1 to 2 in., 79¢; 0.165 to 0.219 in. wall; OD, ⅝ to ¾ in., 64¢; 1 to 2 in., 60¢; 3 to 4 in., 59¢. Other alloys higher. Base, OD: Up to 1½ in., 10,000 lb; 1½ to 3 in., 20,000 lb; over 3 in., 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades; Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	86½	67½	92½
Strip, CR	92½	70½	98½
Rod, bar	82½	65½	88½
Angles, HR	82½	65½	88½
Plate, HR	84½	66½	90½
Seamless Tube	115½	100½	137½
Shot, blocks	....	60	....

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	46.41	....	48.48
Copper, h-r	48.38	44.73	....
Copper, drawn	....	45.98	....
Low brass	44.47	44.41	....
Yellow brass	41.72	41.66	....
Red brass	45.44	45.38	....
Naval brass	45.76	40.07	41.33
Leaded brass	....	....	39.11
Com. bronze	46.95	46.89	....
Mang. bronze	49.48	43.62	45.18
Phos. bronze	66.58	67.08	....
Muntz metal	43.96	39.77	41.02
Ni silver, 10 pct	55.36	....	62.63

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	21.50
Aluminum pig	20.00
Antimony, American, Laredo, Tex.	28.50
Beryllium copper, per lb conta'd Be	$40.00
Beryllium aluminum 5% Be, Dollars per lb contained Be	$72.75
Bismuth, ton lots	$2.25
Cadmium, del'd	$1.70
Cobalt, 97-99% (per lb)	$2.60 to $2.67
Copper, electro, Conn. Valley	29.75 to 30.00
Copper, Lake, delivered	30.00
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$165 to $175
Lead, St. Louis	13.55
Lead, New York	13.75
Magnesium 99.8+%, f.o.b. Freeport, Tex., 10,000 lb, pig	27.00
Ingot	27.75
Magnesium, sticks, 100 to 500 lb.	46.00 to 48.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$210 to $215
Nickel electro, f.o.b. N. Y. warehouse	63.08
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	56.25
Palladium, dollars per troy oz.	$21.00
Platinum, dollars per troy oz.	$84 to $87
Silver, New York, cents per oz.	85.25
Tin, New York	94.25
Titanium, sponge, grade A-1	$4.72
Zinc, East St. Louis	10.25
Zinc, New York	10.75
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb delivered carloads)

85-5-5-5 ingot	
No. 115	25.00
No. 120	24.25
No. 123	23.75
80-10-10 ingot	
No. 305	29.75
No. 315	27.50
88-10-2 ingot	
No. 210	39.00
No. 215	35.50
No. 245	31.00
Yellow ingot	
No. 405	21.25
Manganese bronze	
No. 421	26.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	23.25-24.00
0.60 copper, max.	23.00-23.75
Piston alloys (No. 122 type)	20.50-22.00
No. 12 alum. (No. 2 grade)	20.50-21.00
108 alloy	20.50-21.50
195 alloy	22.00-22.75
13 alloy (0.60 copper max.)	23.00-23.75
ASX-679	20.50-21.50

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—96-97½%	20.75-21.50
Grade 2—92-95%	19.50-20.00
Grade 3—90-92%	18.50-19.00
Grade 4—85-90%	17.50-19.00

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper	
Cast, oval, 15 in. or longer	44.54
Electrodeposited	38.38
Flat rolled	47.14
Brass, 80-20	
Cast, oval, 15 in. or longer	43.515
Zinc, flat cast	20.25
Ball, anodes	18.50
Nickel, 99 pct plus	
Cast	84.00
Cadmium	$1.75
Silver 999 fine, rolled, 100 oz. lots per troy oz., f.o.b. Bridgeport, Conn.	94⅛

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63.90
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	30.00
Nickel chloride, 375 lb drum	38.00
Silver cyanide, 100 oz. lots, per oz.	75½
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	54.30

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	26	25¼
Yellow brass	19¾	18
Red brass	23	22¾
Comm. bronze	22⅞	21⅝
Mang. bronze	18¼	17⅛
Yellow brass rod ends	19½	....

Custom Smelters' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	26¼
No. 2 copper wire	24¼
Light copper	23¼
*Refinery brass	21½—22

* Dry copper content.

Ingot Makers' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	26 —26¼
No. 2 copper wire	24½—24¾
Light copper	23 —23¼
No. 1 composition	19½—20
No. 1 comp. turnings	19 —19½
Rolled brass	16
Brass pipe	17
Radiators	15½
Aluminum	
Mixed old cast.	12 —13
Mixed new clips	14 —14½
Mixed turnings, dry	12½—13½
Pots and pans	12 —13

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	24
No. 2 heavy copper and wire	22½—22¾
Light copper	20½—20¾
New type shell cuttings	20½
Auto radiators (unsweated)	13¼—13¾
No. 1 composition	17½
No. 1 composition turnings	16½—17
Unlined red car boxes	14¾—15¼
Cocks and faucets	14¾—15¼
Mixed heavy yellow brass	11½—12
Old rolled brass	14 —14½
Brass pipe	16 —16¼
New soft brass clippings	16¾—17¼
Brass rod ends	14¾—15¼
No. 1 brass rod turnings	12¼—12¾

Aluminum

Alum. pistons and struts	6 — 7
Aluminum crankcases	9½—10
2S aluminum clippings	12 —12½
Old sheet and utensils	9½—10
Borings and turnings	6 — 7
Misc. cast aluminum	9½—10
Dural clips (24S)	10 —10½

Zinc

New zinc clippings	5½— 6
Old zinc	4¼— 4½
Zinc routings	2½— 2¾
Old die cast scrap	3½— 3¾

Nickel and Monel

Pure nickel clippings	60 —65
Clean nickel turnings	40
Nickel anodes	60 —65
Nickel rod ends	60 —65
New Monel clippings	22 —24
Clean Monel turnings	14 —15
Old sheet Monel	20 —22
Nickel silver clippings, mixed	13
Nickel silver turnings, mixed	11

Lead

Soft scrap lead	10¾—11
Battery plates (dry)	5¾— 6
Batteries, acid free	4½

Magnesium

Segregated solids	20 —21
Castings	19 —20

Miscellaneous

Block tin	65 —70
No. 1 pewter	45 —50
No. 1 auto babbitt	38 —40
Mixed common babbitt	12 —12½
Solder joints	15
Siphon tops	35 —40
Small foundry type	15 —15½
Monotype	13½—13¾
Lino. and stereotype	12¾—13
Electrotype	11 —11½
Hand picked type shells	8 — 8½
Lino. and stereo. dross	5 — 5½
Electro dross	3½— 3¾

Midwest Market Rise Spreads East

Chicago prime steelmaking grades up for third week . . . No. 1 heavy up in Detroit, blast furnace in Ohio . . . Buffalo steelmaking, blast furnace items rise . . . Relax export curbs.

The scrap market continued to show signs of convalescence this week, although trade doctors were still far from ready to pronounce the patient cured.

Most favorable symptoms came from the Midwest. In Chicago No. 1 heavy melting advanced 50¢ and in Detroit $1. Some other grades reflected the new market strength. Blast furnace grades showed new vigor in Cincinnati, Cleveland and the Valley, and Youngstown.

In Buffalo steelmaking grades rose $1 and blast furnace $2 to $3. Pittsburgh sources are confident that mills will have considerable trouble driving prices any lower. On an overall basis, THE IRON AGE Scrap Composite rose for the third straight week, this time up 17¢ to $24.50.

Dealers and brokers in coastal areas were also happy over the government's action in eliminating virtually all export controls over scrap. Only requirements remaining are orders from foreign buyers and, on exports to countries outside the Western Hemisphere either an import certificate from such countries or a consignee and use statement.

Pittsburgh—Attitude of dealers and brokers toward lower prices has stiffened. In apparent belief the market has touched bottom, sellers of scrap aver that mills will find it difficult from here on to drive prices down further. Scrap handlers say they will not take an order at prevailing prices unless they have material on hand to fill it. In short they believe an order for a substantial tonnage would result in a price increase. Paradoxically, it is admitted that consumers in the area show little interest in new business with exception of an independent mill whose inventory has temporarily slipped below a safe working level.

Chicago—Though mill orders continued in small tonnages, scrap continued to gain strength in price. Reinforced by mill sales in the heavy melting grades, prices continued to inch up and the whole list is beginning to be affected. Asking prices for No. 2 bundles, still a hardship grade, were reported to have reflected slightly the general strengthening, but the grade generally continues to draw no mill buying. As a token of continued faith in the current price rise, some dealers were reported stockpiling small quantities of material in expectation of a further increase.

New York—Steelmaking and blast furnace grades remain lethargic here. Cast, on the other hand, is moving briskly, and some sources predict a price rise if foundry business continues to rise. Export orders for substantial tonnages of steelmaking scrap are available, but the trade doesn't like the terms, feels that foreign customers must pay more to get scrap in any volume.

Philadelphia — Despite stagnant prices at today's low levels, the undertone of the market is one of cautious strength. Dealers are feeling definitely bullish and are now laying down scrap by choice rather than necessity.

Detroit — The trade was feeling about $1 better this week although some wondered whether it was justified. Most purchases seemed to develop from a desire to take advantage of the low prices rather than any immediate need for scrap. One automotive scrap source reported that April lists brought better comparative prices in areas outside Michigan than plants in this particular scrap market.

Cleveland—Rumors of a possible mill purchase and recorded strength in turnings and foundry steel have dealers and brokers here looking hopeful. Prepared turnings increased $1 to $15 in Cleveland and shot up to $18.50 in the Valley on the basis of sales. Cut structural and plate went up $1.50 in Cleveland to $32.50 delivered.

Birmingham — First-of-the-month steel scrap orders were small this month, and brokers say it is probably just as well for at present prices it is hard to fill orders. First of March orders of the largest buyer in the district had not been completely filled at month-end. Some of the larger dealers are reported paying suppliers more than they can get for steel scrap at present prices to keep their sources of supply from drying up.

St. Louis—Market here is unconcerned over the rise in prices in Chicago because of the feeling that it is due rather to covering of short interests by brokers than mill activity. Prices here are generally unchanged. However, there is said to be a strong undertone to the market for dealer grades.

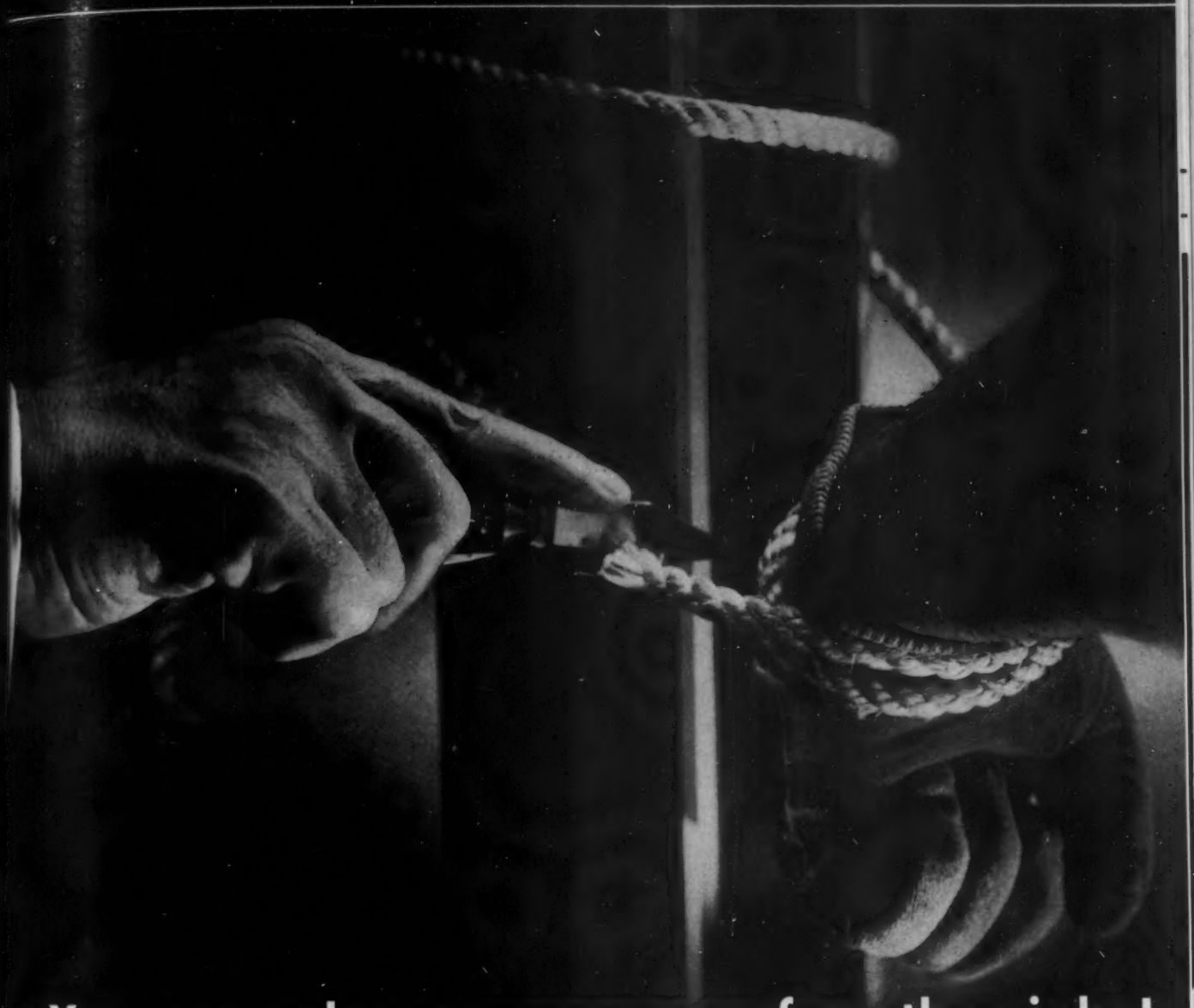
Cincinnati—No. 2 heavy melting, machine shop turnings and short turnings all went up $1 as one steel firm announced April buying prices.

Buffalo—Although tonnages were limited, new business bolstered the scrap market here as steelmaking grades advanced $1 per ton and blast furnace items moved up $2 to $3. Price increases were attributed to a feeling that the bottom had been reached. Some dealers also felt that prices had dropped too far.

Boston—Hardly any scrap is reported moving in this district and optimism in other areas still hasn't rubbed off on New England scrap men. Scattered sales of stove plate pushed up this grade's price $2 per ton but lack of demand resulted in a $1 skid in chemical borings.

West Coast—Newest gimmick in California scrap buying is specifying delivery at the mill. One Los Angeles area steel producer last week began purchase of No. 2 bundles at the base price for the city but with mill delivery amounting to about a $2 freight bill saved. Deal was possible because of lack of competition for glutted No. 2 bundle market in Southern California. No. 1 bundles there also dropped $2 to $17 last week on regular purchases by major buyer.

WHY IT PAYS TO BUY STEEL FROM WAREHOUSE



You can release manpower for other jobs!

WHEN YOU BUY STEEL FROM WAREHOUSE, YOU GET:

- LOWER INVENTORY COSTS
- LOWER SPACE COSTS
- LOWER TIME COSTS
- LOWER CAPITAL INVESTMENT
- FASTER PRODUCTION
- FEWER INVENTORY LOSSES

MOVING steel into your storage area and then moving it out again when it is needed at the production line or job site requires manpower and time. You can reduce these costs by letting U. S. Steel Supply deliver your steel where, when and as it is needed. Complete stocks and fifteen warehouses assure prompt deliveries of your steel.

U. S. STEEL SUPPLY

DIVISION

General Office
208 So. La Salle St., Chicago 4, Ill.

USS

Warehouses and Sales Offices
Coast to Coast

UNITED STATES STEEL

Scrap Prices

(Effective Apr. 6, 1954)

Pittsburgh

No. 1 hvy. melting	$25.00 to $26.00
No. 2 hvy. melting	23.00 to 24.00
No. 1 bundles	25.00 to 26.00
No. 2 bundles	21.00 to 22.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and ms. turns.	13.00 to 14.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Low phos. punch'gs, plate	28.00 to 29.00
Heavy turnings	23.00 to 24.00
No. 1 RR. hvy. melting	28.00 to 29.00
Scrap rails, random lgth.	37.00 to 38.00
Rails 2 ft and under	43.00 to 44.00
RR. steel wheels	32.00 to 33.00
RR. spring steel	32.00 to 33.00
RR. couplers and knuckles	32.00 to 33.00
No. 1 machinery cast.	41.00 to 42.00
Cupola cast.	35.00 to 36.00
Heavy breakable cast.	30.00 to 31.00
Malleable	28.00 to 29.00

Chicago

No. 1 hvy. melting	$26.00 to $27.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 factory bundles	27.00 to 28.00
No. 1 dealers' bundles	26.00 to 27.00
No. 2 dealers' bundles	17.00 to 19.00
Machine shop turn.	10.00 to 11.50
Mixed bor. and turn.	10.00 to 11.50
Shoveling turnings	12.00 to 14.00
Cast iron borings	12.00 to 14.00
Low phos. forge crops	33.00 to 35.00
Low phos. punch'gs, plate	30.00 to 31.00
Low phos. 3 ft and under	29.00 to 30.00
No. 1 RR. hvy. melting	29.00 to 31.00
Scrap rails, random lgth.	31.00 to 32.00
Rerolling rails	35.00 to 37.00
Rails 2 ft and under	40.00 to 42.00
Locomotive tires, cut	32.00 to 33.00
Cut bolsters & side frames	33.00 to 34.00
Angles and splice bars	34.00 to 36.00
RR. steel car axles	37.00 to 38.00
RR. couplers and knuckles	32.00 to 34.00
No. 1 machinery cast.	37.00 to 38.00
Cupola cast.	34.00 to 35.00
Heavy breakable cast.	28.00 to 29.00
Cast iron brake shoes	34.00 to 35.00
Cast iron car wheels	32.00 to 34.00
Malleable	39.00 to 40.00
Stove plate	28.00 to 29.00

Philadelphia Area

No. 1 hvy. melting	$21.00 to $22.00
No. 2 hvy. melting	19.00 to 20.00
No. 1 bundles	21.00 to 22.00
No. 2 bundles	17.00 to 18.00
Machine shop turn.	10.00 to 11.00
Mixed bor. short turn.	10.00 to 11.00
Cast iron borings	10.00 to 11.00
Shoveling turnings	15.00 to 16.00
Clean cast chem. borings	24.00 to 25.00
Low phos. 5 ft and under	24.00 to 26.00
Low phos. 2 ft and under	25.00 to 27.00
Low phos. punch'gs	25.00 to 27.00
Elec. furnace bundles	23.00 to 24.00
Heavy turnings	20.00 to 21.00
RR. steel wheels	29.00 to 30.00
RR. spring steel	29.00 to 30.00
Rails 18 in. and under	39.00 to 40.00
Cupola cast.	34.00 to 35.00
Heavy breakable cast.	36.00 to 37.00
Cast iron carwheels	38.00 to 39.00
Malleable	38.00 to 39.00
Unstripped motor blocks	27.00 to 28.00
No. 1 machinery cast.	39.00 to 40.00
Charging box cast.	36.00 to 37.00

Cleveland

No. 1 hvy. melting	$21.00 to $22.00
No. 2 hvy. melting	18.00 to 19.00
No. 1 bundles	21.00 to 22.00
No. 2 bundles	15.00 to 16.00
No. 1 busheling	20.00 to 21.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Cut struct'r'l plate, 2 ft & under	31.50 to 32.50
Drop forge flashings	21.00 to 22.00
No. 1 RR. heavy melting	26.00 to 27.00
Rails 3 ft and under	43.00 to 44.00
Rails 18 in. and under	44.00 to 45.00
Railroad grate bars	27.00 to 28.00
Steel axle turnings	19.00 to 20.00
Railroad cast.	39.00 to 40.00
No. 1 machinery cast.	40.00 to 41.00
Stove plate	33.00 to 34.00
Malleable	39.00 to 40.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting	$25.00 to $26.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 bundles	25.00 to 26.00
No. 2 bundles	18.00 to 19.00
Machine shop turn.	12.00 to 13.00
Shoveling turnings	17.50 to 18.50
Cast iron borings	17.50 to 18.50
Low phos. plate	27.00 to 28.00

Buffalo

No. 1 hvy. melting	$23.00 to $24.00
No. 2 hvy. melting	19.50 to 20.50
No. 1 busheling	23.00 to 24.00
No. 1 bundles	23.00 to 24.00
No. 2 bundles	17.50 to 18.50
Machine shop turn.	14.00 to 14.50
Mixed bor. and turn.	16.50 to 17.00
Shoveling turnings	17.50 to 18.00
Cast iron borings	16.50 to 17.00
Low phos. plate	27.00 to 28.00
Scrap rails, random, lgth.	33.00 to 34.00
Rails 2 ft and under	40.00 to 41.00
RR. steel wheels	34.00 to 35.00
RR. spring steel	34.00 to 35.00
RR. couplers and knuckles	34.00 to 35.00
No. 1 machinery cast.	38.00 to 39.00
No. 1 cupola cast.	34.00 to 35.00

Detroit

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$16.00 to $17.00
No. 2 hvy. melting	14.00 to 15.00
No. 1 bundles, openhearth	17.00 to 18.00
No. 2 bundles	14.00 to 15.00
New busheling	16.00 to 17.00
Drop forge flashings	16.00 to 17.00
Machine shop turn.	5.50 to 6.50
Mixed bor. and turn.	7.50 to 8.50
Shoveling turnings	7.50 to 8.50
Cast iron borings	7.50 to 8.50
Low phos. punch's, plate	17.00 to 18.00
No. 1 cupola cast.	35.00
Heavy breakable cast.	24.00
Stove plate	33.00
Automotive cast.	35.00

St. Louis

No. 1 hvy. melting	$25.00 to $26.00
No. 2 hvy. melting	23.00 to 24.00
No. 1 bundles	25.00 to 26.00
No. 2 bundles	20.00 to 21.00
Machine shop turn.	10.00 to 11.00
Cast iron borings	12.00 to 13.00
Shoveling turnings	12.00 to 13.00
No. 1 RR. hvy. melting	29.00 to 30.00
Rails, random lengths	34.00 to 35.00
Rails, 18 in. and under	37.00 to 39.00
Locomotive tires, uncut	29.00 to 30.00
Angles and splice bars	30.50 to 32.00
Std. steel car axles	35.00 to 36.00
RR. spring steel	31.50 to 32.50
Cupola cast.	38.00 to 39.00
Hvy. breakable cast.	23.00 to 24.00
Cast iron brake shoes	30.00 to 31.00
Stove plate	31.00 to 32.00
Cast iron car wheels	30.00 to 31.00
Malleable	34.00 to 35.00
Unstripped motor blocks	23.00 to 24.00

New York

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$13.00 to $14.00
No. 2 hvy. melting	11.00 to 12.00
No. 2 bundles	9.00 to 10.00
Machine shop turn.	4.00 to 5.00
Mixed bor. and turn.	6.00 to 7.00
Shoveling turnings	7.00 to 8.00
Clean cast chem. borings	18.00 to 19.00
No. 1 machinery cast.	35.00 to 36.00
Mixed yard cast.	29.00 to 30.00
Charging box cast.	29.00 to 30.00
Heavy breakable cast.	29.00 to 30.00
Unstripped motor blocks	22.00 to 23.00

Birmingham

No. 1 hvy. melting	$20.00
No. 2 hvy. melting	18.00
No. 1 bundles	20.00
No. 2 bundles	$15.00 to 16.00
No. 1 busheling	20.00
Machine shop turn.	12.00
Shoveling turnings	15.00
Cast iron borings	13.00 to 14.00
Electric furnace bundles	25.00 to 26.00
Bar crops and plate	28.00 to 29.00
Structural and plate, 2 ft.	28.00 to 29.00
No. 1 RR. hvy. melting	24.00 to 25.00
Scrap rails, random lgth.	32.00 to 33.00
Rails, 18 in. and under	37.00 to 38.00
Angles & splice bars	35.00 to 36.00
Rerolling rails	33.00 to 34.00
No. 1 cupola cast.	40.00 to 41.00
Stove plate	27.00 to 28.00
Cast iron car wheels	33.00 to 34.00
Charging box cast.	23.00 to 24.00
Heavy breakable	24.00 to 25.00
Unstripped motor blocks	31.00 to 32.00
Mashed tin cans	14.00 to 15.00

Boston

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$13.00 to $16.00
No. 2 hvy. melting	9.00 to 11.00
No. 1 bundles	12.00 to 14.00
No. 2 bundles	7.00 to 9.00
No. 1 busheling	11.00 to 13.00
Elec. furnace, 3 ft & under	13.00 to 16.00
Machine shop turn.	1.00 to 1.50
Mixed bor. and short turn.	6.00 to 7.00
Shoveling turnings	7.00 to 7.25
Clean cast chem. borings	10.00 to 11.00
No. 1 machinery cast.	27.00 to 28.00
Mixed cupola cast.	23.00 to 24.00
Heavy breakable cast.	25.50 to 26.00
Stove plate	22.00 to 23.00
Unstripped motor blocks	7.00 to 8.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$22.00 to $23.00
No. 2 hvy. melting	19.00 to 20.00
No. 1 bundles	22.00 to 23.00
No. 2 bundles	16.00 to 17.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	10.00 to 11.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	10.00 to 11.00
Low phos., 18 in. & under	30.00 to 31.00
Rails, random lengths	34.00 to 35.00
Rails, 18 in. and under	42.00 to 43.00
No. 1 cupola cast.	34.00 to 35.00
Hvy. breakable cast.	29.00 to 30.00
Drop broken cast.	40.00 to 41.00

San Francisco

No. 1 hvy. melting	$20.00
No. 2 hvy. melting	16.00
No. 1 bundles	19.00
No. 2 bundles	16.00
No. 3 bundles	12.00
Machine shop turn.	5.00
Cast iron borings	9.00
No. 1 RR. hvy. melting	23.00
No. 1 cupola cast.	$39.00 to 40.00

Los Angeles

No. 1 hvy. melting	$20.00
No. 2 hvy. melting	16.00
No. 1 bundles	19.00
No. 2 bundles	16.00
No. 3 bundles	12.00
Machine shop turn.	5.00
Shoveling turnings	$7.00 to 9.00
Cast iron borings	7.00 to 9.00
Elec. fur. 1 ft and under.	25.00
No. 1 RR. hvy. melting	20.00
No. 1 cupola cast.	$7.00 to 38.00

Seattle

No. 1 hvy. melting	$23.00
No. 2 hvy. melting	19.00
No. 1 bundles	22.00
No. 2 bundles	16.00
No. 3 bundles	12.00
No. 1 cupola cast.	37.00
Mixed yard cast.	35.00

Hamilton, Ont.

No. 1 hvy. melting	$22.00
No. 2 hvy. melting	19.00
No. 1 bundles	22.00
No. 2 bundles	19.00
Mixed steel scrap	16.00
Bushelings	17.00
Bush., new fact prep'd.	20.00
Bush., new fact unprep'd.	16.00
Short steel turnings	12.00
Mixed bor. and turn.	12.00
Rails, remelting	31.00
Cast scrap	$42.00 to 45.00

Comparison of Prices

(Effective Apr. 6, 1954)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Apr. 6 1954	Mar. 30 1954	Mar. 9 1954	Apr. 7 1953
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	3.925¢	3.925¢	3.925¢	3.775¢
Cold-rolled sheets	4.775	4.775	4.775	4.575
Galvanized sheets (10 ga.)	5.275	5.275	5.275	5.075
Hot-rolled strip	3.925	3.925	3.925	3.725
Cold-rolled strip	5.513	5.513	5.513	5.20
Plate	4.10	4.10	4.10	3.90
Plates wrought iron	9.30	9.30	9.30	9.00
Stainl's C-R strip (No. 302)	41.50	41.50	41.50	38.48
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$8.95	$8.95	$8.95	$8.95
Tinplate, electro (0.50 lb.)	7.65	7.65	7.65	7.65
Special coated mfg. terns	7.75	7.75	7.75	7.75
Bars and Shapes: (per pound)				
Merchant bars	4.16¢	4.16¢	4.16¢	3.95¢
Cold finished bars	5.20	5.20	5.20	4.925
Alloy bars	4.875	4.875	4.875	4.675
Structural shapes	4.10	4.10	4.10	3.85
Stainless bars (No. 302)	35.50	35.50	35.50	32.98
Wrought iron bars	10.40	10.40	10.40	10.05
Wire: (per pound)				
Bright wire	5.525¢	5.525¢	5.525¢	5.225¢
Rails: (per 100 lb.)				
Heavy rails	$4.325	$4.325	$4.325	$3.775
Light rails	5.20	5.20	5.20	4.25
Semifinished Steel: (per net ton)				
Rerolling billets	$62.00	$62.00	$62.00	$59.00
Slabs, rerolling	62.00	62.00	62.00	59.00
Forging billets	75.50	75.50	75.50	70.50
Alloy blooms, billets, slabs	82.00	82.00	82.00	76.00
Wire Rod and Skelp: (per pound)				
Wire rods	4.525¢	4.525¢	4.525¢	4.325¢
Skelp	3.75	3.75	3.75	3.55
Finished Steel Composite: (per pound)				
Base price	4.634¢	4.634¢	4.634¢	4.376¢

	Apr. 6 1954	Mar. 30 1954	Mar. 9 1954	Apr. 7 1953
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$61.19	$61.19	$61.19	$60.49
Foundry, Valley	56.50	56.50	56.50	55.00
Foundry, Southern, Cin'ti	60.43	60.43	60.43	58.93
Foundry, Birmingham	52.88	52.88	52.88	51.38
Foundry, Chicago	56.50	56.50	56.50	55.00
Basic del'd, Philadelphia	60.27	60.27	60.27	59.77
Basic, Valley furnace	56.00	56.00	56.00	54.50
Malleable, Chicago	56.50	56.50	56.50	55.00
Malleable, Valley	56.50	56.50	56.50	55.00
Ferromanganese‡, cents per lb.	10.00¢	10.00¢	10.00¢	8.00¢
‡ 76 pct Mn base.				
Pig Iron Composite: (per gross ton)				
Pig iron	$56.59	$56.59	$56.59	$55.24
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$25.50	$25.50	$24.75	$44.75
No. 1 steel, Phila. area	21.50	21.50	22.50	43.50
No. 1 steel, Chicago	26.50	26.00	23.50	43.50
No. 1 bundles, Detroit	17.50	16.50	16.50	40.50
Low phos., Youngstown	27.50	27.50	26.50	49.50
No. 1 mach'y cast, Pittsburgh	41.50	41.50	41.50	51.50
No. 1 mach'y cast, Philadel'a	39.50	38.50	39.00	48.00
No. 1 mach'y cast, Chicago	37.50	37.00	36.50	47.00
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	$24.50	$24.33	$23.50	$43.92
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.38	$14.38	$14.38	$14.75
Foundry coke, prompt	16.75	16.75	16.75	17.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	29.875‡	29.875‡	29.875‡	31.50‡
Copper, Lake, Conn.	30.00	30.00	30.00	33.25
Tin, Straits, New York	94.25†	95.50	90.00	91.11
Zinc, East St. Louis	10.25	10.25	9.25	11.00
Lead, St. Louis	13.55	13.30	12.55	12.80
Aluminum, virgin ingot	21.50	21.50	21.50	20.80
Nickel, electrolytic	63.08	63.08	63.08	63.08
Magnesium, ingot	27.75	27.75	27.75	27.00
Antimony, Laredo, Tex.	28.50	28.50	28.50	34.50
† Tentative. ‡ Average. * Revised.				

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

← To identify producers, see Key on p. 199 →

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem *B3*	58.00	58.50	59.00	59.50	.....
Birmingham *R3*	52.38	52.88	.....	.....	.....
Birmingham *W9*	52.38	52.88	.....	.....	.....
Birmingham *S5*	52.38	52.88	.....	.....	.....
Buffalo *R3*	56.00	56.50	57.00	.....	.....
Buffalo *H1*	56.00	56.50	57.00	.....	.....
Buffalo *W6*	56.00	56.50	57.00	.....	.....
Chicago *I4*	56.00	56.50	56.50	57.00	.....
Cleveland *A5*	56.00	56.50	56.50	57.00	61.00
Cleveland *R3*	56.00	56.50	56.50	.....	.....
Daingerfield *L3*	52.50	52.50	52.50	.....	.....
Duluth *I4*	56.00	56.50	56.50	57.00	.....
Erie *I4*	56.00	56.50	56.50	57.00	.....
Everett *M6*	.....	.....	61.25	61.75	.....
Fontana *K1*	62.00	62.50	.....	.....	.....
Geneva, Utah *C7*	56.00	56.50	.....	.....	.....
Granite City *G2*	57.90	58.40	58.90	.....	.....
Hubbard *Y1*	.....	.....	56.50	.....	.....
Minnequa *C6*	58.00	59.00	59.00	.....	.....
Monessen *P6*	56.00	.....	.....	.....	.....
Neville Isl. *P4*	56.00	56.50	56.50	.....	.....
Pittsburgh *U1*	56.00	.....	.....	57.00	.....
Sharpsville *S3*	56.00	56.50	56.50	57.00	.....
Steelton *B3*	58.00	58.50	59.00	59.50	64.00
Swedeland *A2*	58.00	58.50	59.00	59.50	.....
Toledo *I4*	56.00	56.50	56.50	57.00	.....
Troy, N. Y. *R3*	58.00	58.50	59.00	59.50	64.00
Youngstown *Y1*	.....	.....	56.50	57.00	.....
N. Tonawanda *T1*	.....	56.50	57.00	.....	.....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct., $2 per ton for .05 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 and over.

Silvery Iron: Buffalo, *H1*, $68.25; Jackson, *J1*, *G1* $67.00. Add $1.50 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add $1 per ton for 0.75 pct. or more phosphorus. Add 75¢ for each 0.50 pct. manganese over 1.0 pct. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

STAINLESS STEEL

Base price cents per lb., f.o.b. mill

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	16.25	17.25	18.75	18.25	28.00	22.75	24.50	14.00	.....	14.25
Slabs, billets, rerolling	20.50–29.75	22.75	24.75	23.75	36.25	29.50	32.25	18.25	.....	18.50
Forg. discs, die blocks, rings	38.50	38.50	41.50	40.50	60.00	45.50	50.75	31.00	31.75	31.75
Billets, forging	29.50	29.75	32.25	31.00	46.50–46.75	35.25	39.50	24.00	24.50	24.50
Bars, wires, structurals	35.25	35.50	38.25	37.25	55.50	42.00	46.75	28.75	29.25	29.25
Plates	37.25	37.50	39.75	39.75	58.75–59.00	45.75–46.00	51.25	30.00	30.50–31.00	30.50
Sheets	46.25	46.50	48.75	48.75	64.50	55.50	60.75	40.75	41.25	43.50
Strip, hot-rolled	29.75	32.00	36.75	34.25	55.00	42.00	46.50	26.25	.....	27.00
Strip, cold-rolled	38.25	41.50	45.50	43.75	66.50	54.50	59.25	34.25	41.25	34.75

STAINLESS STEEL PRODUCING POINTS

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; McKeesport, Pa., *U1*; Washington, Pa., *W2*, *J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Ft. Wayne, *J4*.

Strip: Midland, Pa., *C11*; Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Middletown, O., *A7*; Harrison, N. J., *D3*; Youngstown, *C5*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (.25¢ per lb higher) *W1* (.25¢ per lb higher); New Bedford, Mass., *R6*.

Bars: Baltimore, *A7*; Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*; Ft. Wayne, *I4*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*.

Forged discs, die blocks, rings: Pittsburgh, *C11*; Syracuse, *C11*; Ferndale, Mich., *A3*; Washington, Pa., *J2*.

Forging billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*, Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*.

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STEEL PRICES

(Effective Apr. 6, 1954)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$82.00 *B3*		4.15 *B3*	6.20 *B3*	4.15 *B3*						
	Buffalo, N. Y.	$62.00 *B3*	$75.50 *B3, R3*	$82.00 *B3, R3*	4.925 *B3*	4.15 *B3*	6.20 *B3*	4.15 *B3*	3.925 *B3, R3*	5.45 *B3*	6.00 *B3*	8.425 *B3*		
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.								4.05 *A2*		5.90 *A2*			
	New Bedford, Mass.									6.00 *R6*				
	Harrison, N. J.													12.00 *C11*
	Johnstown, Pa.	$62.00 *B3*	$75.50 *B3*	$82.00 *B3*		4.15 *B3*	6.20 *B3*							
	Morrisville, Pa.													
	New Haven, Conn.									5.90 *D1* 6.20 *A5*				
	Phoenixville, Pa.					4.15 *P2*		4.95 *P2*						
	Sparrows Pt., Md.								3.925 *B3*	5.45 *B3*	6.00 *B3*	8.425 *B3*		
	Wallingford, Conn.									5.90 *W1*				
	Worcester, Mass.									6.30 *A5*				12.30 *A5* 12.45 *N7*
MIDDLE WEST	Alton, Ill.								4.10 *L1*					
	Ashland, Ky.								3.925 *A7*					
	Canton-Massillon, Dover, Ohio			$82.00 *R3, T5*										12.00 *G4*
	Chicago, Ill.	$62.00 *U1*	$75.50 *R3, U1, W8*	$82.00 *U1, W8, R3*	4.925 *U1*	4.10 *U1, W8*	6.175 *U1, Y1*	4.10 *U1*	3.925 *A1, W8*	5.70 *A1*	5.95 *R3*		6.40 *W8*	
	Sterling, Ill.													
	Cleveland, Ohio		$75.50 *R3*							5.45 *A5, J3*		7.80 *J3* 8.15 *A5*		12.00 *A5* 12.15 *N7*
	Detroit, Mich.			$84.00 *R5*					4.125 *G3* 4.15 *M2*	5.65 *D1, D2, G3, M2, P11*	6.15 *G3*	7.90 *D2* 8.35 *G3*		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$62.00 *U1*	$75.50 *U1*	$82.00 *U1, Y1*	4.925 *I3*	4.10 *I3, U1*	6.175 *U1, I3*		3.925 *I3, U1, Y1*	5.70 *I3*	5.95 *U1, I3* 6.45 *Y1*		6.40 *U1*	
	Granite City, Ill.													
	Indianapolis, Ind.									5.60 *C5*				
	Mansfield, Ohio													
	Middletown, Ohio									5.45 *A7*				
	Niles, Warren, Ohio Sharon, Pa.								3.925 *S1*	5.45 *S1, T4*	5.95 *S1*	7.65 *S1*	8.40 *S1*	12.00 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$62.00 *U1, J3*	$75.50 *J3, U1*	$82.00 *U1, C11*	4.925 *U1*	4.10 *J3, U1*	6.175 *J3, U1*	4.10 *U1*	3.925 *A7, P6* 3.95 *S7* 4.425 *S9*	5.45 *B4, J3, S7*		7.80 *J3*	6.40 *S9* 6.45 *S7*	12.00 *S9* 12.15 *S7*
	Portsmouth, Ohio								3.925 *P7*					
	Weirton, Wheeling, Follansbee, W. Va.					4.10 *W3*			3.925 *W3*	5.45 *F3, W3*	5.95 *W3*	8.15 *W3*		
	Youngstown, Ohio			$82.00 *Y1, C10*		4.10 *Y1*	6.675 *Y1*		3.925 *R3, U1, Y1*	5.45 *R3, Y1, C5*	5.95 *U1, R3* 6.45 *Y1*	7.60 *R3* 8.30 *Y1*	6.40 *U1*	12.00 *C5*
WEST	Fontana, Cal.	$70.00 *K1*	$83.50 *K1*	$101.00 *K1*		4.75 *K1*	6.825 *K1*	5.10 *K1*	4.70 *K1*	7.35 *K1*	7.05 *K1*		7.80 *K1*	13.65 *K1*
	Geneva, Utah		$75.50 *C7*			4.10 *C7*	6.175 *C7*							
	Kansas City, Mo.					4.70 *S2*	6.775 *S2*		4.525 *S2*		6.55 *S2*		7.90 *S2*	
	Los Angeles, Torrance, Cal.		$85.00 *B2*	$102.00 *B2*		4.80 *B2, C7*	6.85 *B2*		4.675 *B2, C7*	7.50 *C1*			7.60 *B2*	
	Minnequa, Colo.					4.55 *C6*			5.025 *C6*					
	San Francisco, Niles, Pittsburg, Cal.		$85.00 *B2*			4.75 *B2* 4.91 *P9*	6.80 *B2*		4.675 *B2, C7*					
	Seattle, Wash.		$89.00 *B2, S11*			4.85 *B2*	6.90 *B2*							
SOUTH	Atlanta, Ga.								4.125 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$62.00 *T2*	$75.50 *T2*			4.10 *R3, T2*	6.175 *T2*		3.925 *R3, T2, C16*		5.95 *T2*			
	Houston, Tex.		$83.50 *S2*	$90.00 *S2*		4.50 *S2*			4.425 *S2*				6.80 *S2*	

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL PRICES

(Effective Apr. 6, 1954)

SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE	
Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized *10* ga.	Enameling *12* ga.	Long Terne *10* ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled *19* ga.		Coke* *1.25*-lb. base box	Electro* *0.25*-lb. base box	Holloware Enameling *29* ga.	
													Bethlehem, Pa.
3.925 *B3*	4.775 *B3*				5.90 *B3*	7.225 *B3*			4.525 *W6*				Buffalo, N. Y.
										† Special coated mfg. terne deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb deduct $2.20 from 1.25-lb coke base box. * COKES: 1.50-lb add 25¢. ELECTRO: 0.50-lb add 25¢; 0.75-lb add 65¢; 1.00-lb add $1.20.			Claymont, Del.
													Coatesville, Pa.
3.975 *A2*					5.90 *A2*								Conshohocken, Pa.
													Harrisburg, Pa.
													Hartford, Conn.
									4.525 *B3*				Johnstown, Pa.
3.975 *U1*	4.825 *U1*				5.95 *U1*	7.275 *U1*				$8.80 *U1*	$7.50 *U1*		Morrisville, Pa.
													New Haven, Conn.
													Phoenixville, Pa.
3.925 *B3*	4.775 *B3*	5.275 *B3*			5.90 *B3*	7.225 *B3*	8.075 *B3*		4.625 *B3*	$8.80 *B3*	$7.50 *B3*		Sparrows Pt., Md.
									4.825 *A5*				Worcester, Mass.
													Trenton, N. J.
									4.70 *L1*				Alton, Ill.
3.925 *A7*		5.275 *A7*	5.175 *A7*										Ashland, Ky.
		5.275 *R1, R3*						5.05 *R1*					Canton-Massillon, Dover, Ohio
3.925 *A1, W8*					5.90 *U1*				4.525 *A5, N4, R3*				Chicago, Joliet, Ill.
									4.625 *N4*				Sterling, Ill.
3.925 *J3, R3*	4.775 *J3, R3*		5.175 *R3*		5.90 *J3, R3*	7.225 *J3, R3*			4.525 *A5*				Cleveland, Ohio
4.125 *G3* 4.15 *M2*	4.975 *G3*				6.10 *G3*	7.425 *G3*							Detroit, Mich.
3.925 *N5*													Newport, Ky.
3.925 *I3, U1, Y1*	4.775 *I3, U1, Y1*	5.275 *U1, I3*	5.175 *I3, U1*	5.675 *U1*	5.90 *U1, I3* 6.40 *Y1*	7.225 *U1* 7.725 *Y1*				$8.70 *I3, U1, Y1*	$7.40 *I3, U1*	6.10 *U1, Y1*	Gary, Ind. Harbor, Indiana
4.125 *G2*	4.975 *G2*	5.475 *G2*	5.875 *G2*								$7.60 *G2*	6.30 *G2*	Granite City, Ill.
4.025 *C9*		5.375 *C9*						5.025 *C9*					Kokomo, Ind.
				5.675 *E2*				5.05 *E2*					Mansfield, Ohio
	4.775 *A7*		5.175 *A7*	5.675 *A7*									Middletown, Ohio
3.925 *S1* 5.175 *N3*	5.80 *N3*	5.275 *N3*	6.525 *N3*	5.45 *S1* 5.675 *N3*	5.90 *S1*						$7.40 *R3*		Niles, Ohio Sharon, Pa.
3.925 *J3, U1, P6, A1*	4.775 *J3, U1, P6*	5.275 *U1*	5.175 *U1*		5.90 *J3, U1*	7.225 *J3, U1*	7.925 *U1*		4.525 *A5* 4.725 *P6*	$8.70 *J3, U1*	$7.40 *J3, U1*	6.10 *U1*	Pittsburgh, Pa. Midland, Pa. Butler, Pa.
3.925 *P7*	4.775 *P7*								4.525 *P7*				Portsmouth, Ohio
3.925 *W3, W5*	4.775 *W3, W5, F3*	5.275 *W3, W5*		5.675 *W3, W5*	5.90 *W3*	7.225 *W3*				$8.70 *W3, W5*	$7.40 *W3, W5*	6.10 *F3, W5*	Weirton, Wheeling, Follansbee, W. Va.
3.925 *R3, U1, Y1*	4.775 *R3, Y1*		5.175 *Y1*		5.90 *U1, R3* 6.40 *Y1*	7.225 *R3* 7.725 *Y1*			4.525 *Y1*	$8.70 *R3*			Youngstown, Ohio
4.70 *K1*	5.875 *K1*				6.675 *K1*	8.275 *K1*			5.325 *K1*				Fontana, Cal.
4.025 *C7*													Geneva, Utah
								4.775 *C6*	4.865 *S2*				Kansas City, Mo.
4.625 *C7*		6.275 *C7*							5.325 *B2*				Los Angeles, Torrance, Cal.
									4.775 *C6*				Minnequa, Colo.
4.625 *C7*	5.725 *C7*	6.825 *C7*							5.175 *C7*	$9.45 *C7*	$8.15 *C7*		San Francisco, Niles, Pittsburg, Cal.
													Seattle, Wash.
													Atlanta, Ga.
3.925 *R3, T2*	4.775 *T2*	5.275 *R3, T2*			5.90 *T2*			5.125 *T2* 5.225 *R3*	4.525 *T2 R3*	$8.80 *T2*	$7.50 *T2*		Fairfield, Ala. Alabama City, Ala.
4.325 *S2*									4.925 *S2*				Houston, Texas

STEEL PRICES

(Effective Apr. 6, 1954)

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		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfg's Bright
EAST	Bethlehem, Pa.				4.875 *B3*	6.325 *B3*	6.225 *B3*					
	Buffalo, N. Y.	4.15 *B3* 4.18 *R3*	4.15 *B3,R3*	5.25 *B5*	4.875 *B3,R3*	6.325 *B3,B5*	6.225 *B3*	4.10 *B3*			6.25 *B3*	5.525 *W6*
	Claymont, Del.							4.10 *C4*		5.55 *C4*		
	Coatesville, Pa.							4.10 *L4*		5.55 *L4*		
	Conshohocken, Pa.							4.10 *A2*	5.15 *A2*		6.25 *A2*	
	Harrisburg, Pa.							4.10 *C3*	5.15 *C3*			
	Hartford, Conn.			5.75 *R3*		6.775 *R3*						
	Johnstown, Pa.	4.15 *B3*	4.15 *B3*		4.875 *B3*		6.225 *B3*	4.10 *B3*		5.55 *B3*	6.25 *B3*	5.525 *B3*
	Morrisville, Pa.	4.30 *U1*	4.30 *U1*		5.025 *U1*							
	Newark, N. J.			5.65 *W10*		6.65 *W10*						
	New Haven, Conn.											
	Camden, N. J.			5.65 *P10*		6.50 *P10*						
	Putnam, Conn.			5.75 *W10*								
	Sparrows Pt., Md.		4.15 *B3*					4.10 *B3*		5.55 *B3*	6.25 *B3*	5.625 *B3*
	Palmer, Worcester, Mansfield, Mass.			5.75 *B5* 6.10 *W11*		6.775 *B5*						5.825 *A5, W6*
	Readville, Mass.			5.75 *C14*								
MIDDLE WEST	Alton, Ill.	4.35 *L1*										5.70 *L1*
	Ashland, Ky.							4.10 *A7*				
	Canton-Massillon, Ohio			5.20 *R2,R3*	4.875 *R3,T5*	6.325 *R2,R3, T5*						
	Chicago, Joliet, Ill.	4.15 *U1, N4,W8* 4.22 *R3*	4.15 *R3,N4*	5.20 *A5,W10, W8,B5,L2*	4.875 *U1, W8,R3*	6.325 *A5,W8, W10,L2, R3,B5*		4.10 *U1,W8*	5.15 *U1*	5.55 *U1*	6.25 *U1*	5.525 *A1, R3,N4,W7*
	Cleveland, Ohio	4.21 *R3*	4.15 *R3*	5.20 *A5,C13*		6.325 *A5, C13*		4.10 *J3,R3*	5.15 *J3*		6.25 *J3*	5.525 *A5, R3,C13*
	Detroit, Mich.	4.30 *R5* 4.35 *G3*		5.35 *R5,P8* 5.40 *B5* 5.45 *P3*	4.975 *R5* 5.075 *G3*	6.425 *R5* 6.475 *P8* 6.525 *B5,P3*	6.425 *G3*	4.30 *G3*			6.45 *G3*	
	Duluth, Minn.											5.525 *A5*
	Gary, Ind. Harbor, Crawfordsville	4.15 *I3, U1, Y1*	4.15 *I3, U1, Y1*	5.20 *R3*	4.875 *I3, U1, Y1*	6.325 *R3,M5*	6.225 *U1,I3* 6.725 *Y1*	4.10 *I3, U1, Y1*	5.15 *I3*	5.55 *U1*	6.25 *U1,I3* 6.75 *Y1*	5.625 *M4*
	Granite City, Ill.							4.30 *G2*				
	Kokomo, Ind.											5.625 *C9*
	Sterling, Ill.	4.25 *N4*	4.25 *N4*									5.625 *N4*
	Niles, Ohio Sharon, Pa.							4.10 *S1*		5.55 *S1*	6.25 *S1*	
	Pittsburgh, Pa. Midland, Pa.	4.15 *J3, U1*	4.15 *J3, U1*	5.20 *A5, J3, W10,R3,C8*	4.875 *U1,C11*	6.325 *A5,C11, W10,C8*	6.225 *J3, U1*	4.10 *J3, U1*	5.15 *U1*	5.55 *U1*	6.25 *J3, U1*	5.525 *A5, J3,P6*
	Portsmouth, Ohio											5.525 *P7*
	Weirton, Wheeling, Follansbee, W. Va.	4.15 *W3*						4.10 *W3*				
	Youngstown, Ohio	4.15 *U1,Y1* 4.20 *R3*	4.15 *R3, U1, Y1*	5.20 *Y1,F2*	4.875 *U1,Y1, C10*	6.325 *Y1, C10,F2*	6.225 *U1* 6.725 *Y1*	4.10 *R3, U1, Y1*			6.75 *Y1*	5.525 *Y1*
WEST	Emeryville, Cal.	4.90 *J5*	4.90 *J5*									
	Fontana, Cal.	4.85 *K1*	4.85 *K1*		5.925 *K1*		7.475 *K1*	4.75 *K1*		6.60 *K1*	6.95 *K1*	
	Geneva, Utah							4.10 *C7*			6.25 *C7*	
	Kansas City, Mo.	4.75 *S2*	4.85 *S2*		5.475 *S2*		6.825 *S2*					6.125 *S2*
	Los Angeles, Torrance, Cal.	4.85 *B2,C7*	4.85 *B2,C7*	6.65 *R3*	5.925 *B2*		6.925 *B2*					6.475 *B2*
	Minnequa, Colo.	4.60 *C6*	4.75 *C6*					4.95 *C6*				5.775 *C6*
	Portland, Ore.	4.90 *O2*										
	San Francisco, Niles, Pittsburg, Cal.	4.85 *C7,P9* 4.90 *B2*	4.85 *C7,P9* 4.90 *B2*				6.975 *B2*					6.475 *C7*
	Seattle, Wash.	4.90 *B2,N6*	4.90 *B2,S11*				6.975 *B2*	5.00 *B2*			7.15 *B2*	
SOUTH	Atlanta, Ga.	4.35 *A8*	4.35 *A8*									5.725 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	4.15 *T2,C16* 4.18 *R3*	4.15 *R3, T2, C16*				6.225 *T2*	4.10 *R3,T2*			6.25 *T2*	5.525 *R3, T2*
	Houston, Ft. Worth, Lone Star, Tex.	4.55 *S2*	4.55 *S2*		5.275 *S2*			4.50 *L3, S2*				5.925 *S2*

Steel Prices

(Effective Apr. 6, 1954)

Key to Steel Producers

With Principal Offices

A1 Acme Stee Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metal Products Co., Youngstown
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, New York
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Co., Inc., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Co., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N5 Newport Steel Corp., Newport, Ky.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sloss Sheffield Steel & Iron Co., Birmingham
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Sweet's Steel Co., Williamsport, Pa.
S11 Seidelhuber Steel Rolling Mills, Seattle

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
T7 Texas Steel Co., Fort Worth

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Fred Ulbrich & Sons, Wallingford, Conn.

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W11 Worcester Pressed Steel Co., Worcester, Mass.

Y1 Youngstown Sheet & Tube Co., Youngstown

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal
STANDARD T. & C.																						
Sparrows Pt. *B3*	24.25	8.0	27.25	12.0	29.75	15.5	32.25	16.5	32.75	17.5	33.25	18.0	34.75	18.0								
Youngstown *R3*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Fontana *K1*	13.25	+2.0	16.25	1.0	18.75	4.5	21.25	5.5	21.75	6.5	22.25	7.0	23.75	7.0								
Pittsburgh *J3*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Alton, Ill. *L1*	24.25	8.0	27.25	12.0	29.75	15.5	32.25	16.5	32.75	17.5	33.25	18.0	34.75	18.0								
Sharon *M3*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Morrisville *N2*	24.25		27.25		29.75		32.25		32.75		33.25		34.75									
Pittsburgh *N1*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Wheeling *W5*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Wheatland *W4*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Youngstown *Y1*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Indiana Harbor *Y1*	25.25	9.0	28.25	13.0	30.75	16.5	33.25	17.5	33.75	18.5	34.25	19.0	35.75	19.0								
Lorain *N2*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	27.75	13.0	31.75	17.0	33.75	20.5	34.25	19.5	34.75	20.5	35.25	21.0	35.75	20.0								
Youngstown *R3*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Fontana *K1*	16.75		20.75		22.75		23.25		23.75		24.25		24.75									
Pittsburgh *J3*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Alton, Ill. *L1*	27.75	13.0	31.75	17.0	33.75	20.5	34.25	19.5	34.75	20.5	35.25	21.0	35.75	20.0								
Sharon *M3*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Pittsburgh *N1*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Wheeling *W5*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Wheatland *W4*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Youngstown *Y1*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Indiana Harbor *Y1*	28.75	14.0	32.75	18.0	34.75	21.5	35.25	20.5	35.75	21.5	36.25	22.0	36.75	21.0								
Lorain *N2*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75

Galvanized discounts based on zinc, at 11¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ⅛ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt.; 2½ in., 3 in., ½ pt. Calculate discounts on even cents per lb of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢. Threads only buttweld and seamless, 2¼ pts. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 4½ pts. higher discount. Buttweld jobbers' discount, 5 pct. East St. Louis zinc price now 10.25¢

Steel Prices

(Effective Apr. 6, 1954)

To identify producers, see Key on preceding page.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *U1*	4.325	5.20	5.275				
Chicago *R3*				7.05			
Cleveland *R3*							
Ensley *T2*	4.325	5.20					
Fairfield *T2*		5.20		7.05		5.125	
Gary *U1*	4.325	5.20				5.125	
Ind. Harbor *I3*	4.325		5.275	7.05		5.125	
Johnstown *B3*		5.20					
Joliet *U1*		5.20	5.275				
Kansas City *S2*				7.30			11.00
Lackawanna *B3*	4.325	5.20	5.275			5.125	
Lebanon *B3*				7.05	10.50		11.00
Minnequa *C6*	4.325	5.70	5.275	7.05		5.125	11.00
Pittsburgh *O1*					10.50		11.00
Pittsburgh *P5*					10.50		11.00
Pittsburgh *J3*				7.05			
Pitt'g, Cal. *C7*						5.275	
Seattle *B7*				7.55		5.275	11.50
Steelton *B3*	4.325		5.275			5.125	
Struthers *Y1*							
Torrance *C7*						5.275	
Youngstown *R3*				7.05			

ELECTRICAL SHEETS

22 Ga. H-R cut length F.o.b. Mill Cents Per Lb.	Armature	Elec.	Motor	Dynamo	Transf. 72	Transf. 65	Transf. 58
Beech Bottom *W5*		8.75	9.75	10.65	11.60	12.15	12.65
Brackenridge *A5*		8.75	9.75	10.65	11.60		12.65
Granite City *G2*	8.60	9.20	10.20				
Ind. Harbor *I3*	8.15	8.75	9.75				
Mansfield *E2*	8.15	8.75	9.75	10.65			
Newport, Ky. *N5*	8.15	8.75	9.75	10.65	11.60		
Niles, O. *N3*	8.15	8.75	9.75				
Vandergrift *U1*	8.15	8.75	9.75	10.65	11.60	12.15	12.65
Warren, O. *R3*	8.15	8.75	9.75				
Zanesville *A7*	8.15	8.75	9.75	10.65	11.60	12.15	12.65

CLAD STEEL

	Plate	Sheet
Stainless-carbon		
No. 304, 20 pct.		
Coatesville, Pa., *L4*	*32.7	
Washington, Pa., *J2*	....	
Claymont, Del., *C4*	....	
New Castle, Ind., *I2*	....	32.50
Nickel-carbon		
10 pct. Coatesville, Pa., *L4*	37.5	
Inconel-carbon		
10 pct. Coatesville, Pa., *L4*	46.10	
Monel-carbon		
10 pct. Coatesville, Pa., *L4*	38.90	

* Includes annealing and pickling, sandblasting.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Cal	Woven Wire Fence 9–15½ ga. Cal	"T" Fence Posts Cal	Single Loop Bale Ties Cal	Twisted Barbless Wire Cal	Galv. Barbed Wire Cal	Merch. Wire Annld ¢/lb.	Merch. Wire* Galv. ¢/lb.
Alabama City *R3*	131	140	...	149	...	153	6.675	7.075
Aliquippa, Pa. *J3*	131	143	...	...	...	150	6.675	7.20
Atlanta *A8*	133	145	...	151	...	158	6.775	7.30
Bartonville *K2*	133	144	...	...	...	157	6.775	7.275
Buffalo *W6*								
Chicago, Ill. *N4*	131	143	...	149	155	155	6.675	7.175
Cleveland *A6*	137							
Cleveland *A5*						6.675		
Crawfrdsvl. *M4*	133	145	...	151	...	153	6.775	7.325
Donora, Pa. *A5*	131	140	...	149	...	153	6.675	7.075
Duluth *A5*	131	140	145	149	...	153	6.675	7.075
Fairfield, Ala. *T2*	131	140	...	149	...	153	6.675	7.075
Galveston *D4*	139	148						
Houston *S2*	139	148				161	7.975	7.475
Johnstn., Pa. *B3*	131	143	145	...	156	156	6.675	7.225
Joliet, Ill. *A5*	131	140	...	149	...	153	6.675	7.075
Kokomo, Ind. *C9*	133	142	...	151	...	155	6.775	7.175
Los Angeles *B2*						7.625		
Kansas City *S2*	143	152	...	161	...	165	7.275	7.825
Minnequa *C6*	136	148	150	154	162	162	6.925	7.325
Monessen *P6*	131	145	...	...	...	157	6.675	7.225
Moline, Ill. *R3*	...	...	145	...	...	...	...	...
Pittsburg, Cal. *C7*	150	163	...	173	173	173	7.625	8.025
Portsmouth *P7*						6.675		
Rankin, Pa. *A5*	131	140				153	6.675	7.075
So. Chicago *R3*	131	140	145	149	...	153	6.675	7.075
S. San Fran. *C6*						173		
Sparrows Pt. *B3*	133	...	...	151	158	158	6.775	7.325
Struthers, O. *Y1*							6.675	7.175
Worcester *A5*	137						6.975	
Williamsport, Pa. *S10*	133	...	158					

Cut Nails, carloads, base $8.00 per keg (less 20¢ to jobbers), at Conshohocken, Pa. (*A2*).

* Alabama City and So. Chicago don't include zinc extra. Galvanized products computed with zinc at 11.0¢ per lb.

WAREHOUSES

Base price, f.o.b., dollars per 100 lb.

Cities	City Delivery Charge	Sheets: Hot-Rolled	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)	Strip: Hot-Rolled	Strip: Cold-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled	Bars: Cold-Finished	Alloy Bars: Hot-Rolled A 4615 As rolled	Alloy Bars: Hot-Rolled A 4140 Annealed	Alloy Bars: Cold-Drawn A 4615 As rolled	Alloy Bars: Cold-Drawn A 4140 Annealed
Baltimore	$.20	6.20	7.64	7.78	7.00	.....	6.85	6.98	6.86	8.17	.....	.....	.....	.....
Birmingham	.15	6.15	7.00	8.00[4]	6.30	.....	6.35	6.35	6.15	8.75	.....	.....	.....	.....
Boston	.20	6.89	7.83	9.18	7.13	9.23–9.35[2]	7.13	7.06	6.87	8.35	.....	12.05	.....	14.50
Buffalo	.20	6.20–6.35	7.15–7.70	8.85–9.01	6.65–6.79	.....	6.65–6.68	6.55–6.59	6.35	7.70	.....	11.95	.....	14.25
Chicago	.20	6.18	7.12	8.15	6.42	.....	6.33–6.38	6.46	6.28	7.30	.....	11.75	.....	14.25
Cincinnati	.15	6.51	7.19	8.10	6.72	.....	6.80	6.93	6.58	7.86	.....	12.17	.....	14.87
Cleveland	.20	6.18	7.12	7.90	6.58	.....	6.50	6.79	6.34	7.40	.....	11.89	.....	14.39
Denver		7.95	8.85	10.47	8.20	9.55	7.95	7.95	8.05	9.05	.....	16.05	.....	15.75
Detroit	.20	6.35–6.45	7.29–7.31	8.42	6.69–7.71	7.36	6.80	6.91–6.93	6.56	7.60	12.47	11.92	14.42	13.44–14.62
Houston	.20	7.15	7.60–7.85	9.40	7.45	.....	7.20	7.35	7.45	9.30	.....	12.95	.....	.....
Kansas City	.20	6.85	7.79	8.67	7.09	.....	7.00–7.05	7.13	6.95	8.08	.....	12.42	.....	.....
Los Angeles	.20	7.25	9.00	9.70	7.55	10.75–11.30	7.20	7.35	7.15–7.25	9.10–9.75	13.20	13.05	15.75	15.85–16.05
Memphis	.10	6.79	7.69	.....	6.90	.....	7.01	7.09	6.88	7.89–8.31	.....	.....	.....	.....
Milwaukee	.20	6.35	7.12	8.00–8.32	6.59–6.60	8.07	6.58–6.55	6.61–6.63	6.45	7.57	.....	11.92	.....	14.42
New Orleans	.15	6.51	7.41	9.32	6.63	10.42	6.73	6.81–7.45	6.60	8.42–10.42	.....	.....	.....	.....
New York	.30	6.78	7.75[5]–8.20	8.42–8.67[3]	7.16	9.05	6.99	6.90	7.06	8.43	12.29	12.14	14.54	14.64
Norfolk	.20	6.90	.....	.....	7.20	.....	7.15	7.20	7.20	8.50	.....	.....	.....	.....
Philadelphia	.25	6.60	7.38	8.15	7.02	.....	6.63	6.67	6.87	8.24	12.04	11.89	14.29	14.39
Pittsburgh	.20	6.18	7.12	8.00	6.55	.....	6.33	6.46	6.28	7.65	.....	11.75	.....	14.25
Portland	.10	7.90	8.45	9.15	7.65	.....	7.30	7.25	7.35	10.65	.....	.....	.....	.....
Salt Lake City	.20	9.05	10.80	10.65	9.35	11.25	8.70	8.85	9.10–9.20	11.25	.....	.....	.....	.....
San Francisco	.20	7.35	8.70	9.50–10.15	7.60	10.35	7.20	7.25	7.15	9.75–9.85	13.20	12.80–13.05	15.50	15.55–16.05
Seattle	.20	8.15	9.50	9.80	8.00	.....	7.60	7.50	7.60	10.65	.....	13.40	.....	16.00
St. Louis	.20	6.48	7.42	8.45	6.72	8.47	6.73	6.86	6.58	7.50–7.70	12.20	12.05	12.20	14.55
St. Paul	.15	6.84	7.78	8.66	7.08	.....	6.99	7.12	6.94	8.06	.....	12.42	.....	.....

Base Quantities (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.

Exceptions: (1)500 to 1499 lb. (2)20,000 lb or over. (3)450 to 1499 lb. (4)500 to 9999 lb. (5)1000 lb or over. (6)400 to 1499 lb.

C-R SPRING STEEL

Cents Per Lb. F.o.b. Mill	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Bridgeport, Conn. *S7**	5.75	7.65	8.60	10.55	12.85
Carnegie, Pa. *S9*	.....	7.65	8.60	10.55	12.85
Cleveland *A5*	5.45	7.65	8.60	10.55	12.85
Detroit *D1*	5.65	7.85	8.80	10.55	.....
Detroit *D2*	5.65	7.85	8.80	.....	.....
Harrison, N. J. *C11*	.....	.....	8.90	10.85	13.15
Indianapolis *C5*	5.60	7.80	8.60	10.55	.....
New Castle, Pa. *B4*	5.80	8.00	8.60	.....	.....
New Haven, Conn. *D1*	5.90	7.95	8.90	10.85	.....
Riverdale, Ill. *A1*	5.70	7.80	8.75	10.70	13.00
Sharon, Pa. *S1*	5.45	7.65	8.60	10.55	12.85
Trenton *R4*	.....	7.95	8.90	10.85	13.15
Wallingford *W1*	6.20	7.95	8.90	10.85	13.15
Warren, Ohio *T4*	5.45	7.65	8.60	10.55	12.85
Weirton, W. Va. *W3*	5.45	7.65	8.60	10.55	12.85
Worcester, Mass. *A5*	6.30	7.95	8.90	10.85	13.15
Youngstown *C3*	5.45	7.65	8.60	10.55	.....

* Sold on Pittsburgh base.

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	27.34	32.98	26.51	31.91
	2½	12	36.82	44.41	35.70	43.07
	3	12	42.52	51.28	41.23	49.73
	3½	11	49.63	59.87	48.13	58.06
	4	10	65.91	79.50	63.92	77.10
National/Tube	2	13	.....	32.98	26.51	.....
	2½	12	36.82	44.41	35.70	.....
	3	12	42.52	51.28	41.23	.....
	3½	11	49.63	59.87	48.13	.....
	4	10	65.91	79.50	63.92	.....
Pittsburgh Steel	2	13	27.34	32.98	.....	.....
	2½	12	36.82	44.41	.....	.....
	3	12	42.52	51.28	.....	.....
	3½	11	49.63	59.87	.....	.....
	4	10	65.91	79.50	.....	.....

Miscellaneous Prices

(Effective Apr. 6, 1954)

TOOL STEEL

F.o.b. Mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.48
18	4	1	—	5	2.16
18	4	2	—	—	1.64
1.5	4	1.5	8	—	.895
6	4	2	6	—	1.005

High-carbon chromium ..... .70
Oil hardened manganese ..... .39
Special carbon ..... .355
Extra carbon ..... .30
Regular carbon ..... .25

Warehouse prices on and east of Mississippi are 3.5¢ per lb. higher. West of Mississippi, 5.5¢ higher.

CAST IRON WATER PIPE

Per Net Ton

6 to 24-in., del'd Chicago $111.80 to $115.30
6 to 24-in., del'd N. Y. .. 115.00 to 116.00
6 to 24-in., Birmingham. 98.00 to 102.50
6-in. and larger f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less .....$129.50 to $131.50
Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices effective July 1, 1953, to end of 1954 season.

Gross Ton

Openhearth lump $11.15
Old range, bessemer 10.30
Old range, nonbessemer 10.15
Mesabi, bessemer 10.05
Mesabi, nonbessemer 9.90
High phosphorus 9.90

Prices based on upper Lakes rail freight rates, Lake vessel freight rates, handling and unloading charges, and taxes thereon, in effect on June 24, 1953. Increases or decreases after such date are for buyer's account.

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$14.25 to $14.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$16.50 to $17.00
Foundry, oven coke	
Buffalo, del'd	$28.08
Chicago, f.o.b.	24.50
Detroit, f.o.b.	25.50
New England, del'd	26.05
Seaboard, N. J., f.o.b.	24.00
Philadelphia, f.o.b.	23.95
Swedeland, Pa., f.o.b.	23.85
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.43
Cincinnati, del'd	26.56
St. Paul, f.o.b.	23.75
St. Louis, f.o.b.	26.00
Birmingham, f.o.b.	22.65
Lone Star, Tex., f.o.b.	18.50

ELECTRODES

Cents per lb, f.o.b. plant threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb.
	GRAPHITE	
24	84	20.50
20	72	20.00
12, 14, 18	72	20.50
7 to 10	60	21.00
6	60	23.25
4	40	26.00
3	40	27.25
2½	30	28.00
2	24	43.50
	CARBON	
40	100, 110	8.95
35	110	8.95
30	110	8.95
24	72 to 84	9.10
20	90	8.95
17	72	9.10
14	72	9.50
10, 12	60	10.30
8	60	10.55

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base, discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Nuts, Hot Pressed, Cold Punched—Sq.

Pct Off List

	Less Keg Reg.	K. Reg.	Less Keg Hvy.	K. Hvy.
½ in. & smaller	+2	15	+2	18
9/16 in. & ⅝ in.	+7	11	+32*	+10*
¾ in. to 1½ in. inclusive	+8	10	+27**	+6**
1⅝ in. & larger	+9	9	+27	+6

* 9/16 to ¾ in.
** ⅞ to 1½ in.

Nuts, Hot Pressed—Hexagon

½ in. & smaller	11	26	8	23
9/16 in. & ⅝ in.	2	18	+20	net
¾ in. to 1½ in. inclusive	+6	12	+25	+4
1⅝ in. & larger	+8	10	+25	+4

Nuts, Cold Punched—Hexagon

½ in. & smaller	11	26	8	23
9/16 in. & ⅝ in.	9	24	+2	15
¾ in. to 1½ in. inclusive	+1	16	+9	9
1⅝ in. & larger	+16	3	+20	net

Nuts, Semi-Finished—Hexagon

½ in. & smaller	23	36	14	28
9/16 in. & ⅝ in.	18	32	4	20
¾ in. to 1½ in. inclusive	8	23	+8	10
1⅝ in. & larger	+14	5	+20	net

	Light	
7/16 in. & smaller	33	43
½ in. thru ⅝ in.	26	37
¾ in. to 1½ in. inclusive	18	30

Stove Bolts *Pct Off List*

Packaged, steel, plain finished 44½—10
Packaged, plain finish ..... 25½—10
Bulk, plain finish** 59*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets *Base per 100 lb*

½ in. & larger $8.90

Pct Off List

7/16 in. and smaller 30

Cap and Set Screws

(In bulk) *Pct Off List*

Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright 40
¾ in. thru 1 in up to & including 6 in. 36
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat 43
¾ in. thru 1 in up to & including 6 in. 33
Milled studs 17
Flat head cap screws, listed sizes ... 12
Fillister head cap, listed sizes 7
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter 37

Machine and Carriage Bolts

Pct Off List

	Less Case	C.
½ in. & smaller x 6 in. & shorter	4	20
9/16 in. & ⅝ in. x 6 in. & shorter	5	21
¾ in. & larger x 6 in. & shorter	3	19
All diam. longer than 6 in...	+4	13
Lag, all diam. x 6 in. & shorter	12	27
Lag, all diam. longer than 6 in.	8	23
Plow bolts	30	..

REFRACTORIES

Fire Clay Brick *Carloads per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00) ..$109.00
No. 1 Ohio 102.00
Sec. quality, Pa., Md., Ky., Mo., Ill. 102.00
No. 2 Ohio 93.00
Ground fire clay, net ton, bulk (except Salina, Pa. add $1.50) 16.00

Silica Brick

Mt. Union, Pa., Ensley, Ala. $115.00
Childs, Hays, Pa. 120.00
Chicago District 125.00
Western Utah 131.00
California 138.00
Super Duty
Hays, Pa., Athens, Tex., Windham 132.00
Curtner, Calif. 150.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) 19.00
Silica cement, net ton, bulk, Hays, Pa. 21.00
Silica cement, net ton, bulk, Chicago District, Ensley, Ala. 20.00
Silica cement, net ton, bulk, Utah and Calif. 28.50

Chrome Brick *Per net ton*

Standard chemically bonded Balt.. $86.00
Standard chemically bonded, Curtner, Calif. 96.25
Burned, Balt. 80.00

Magnesite Brick

Standard Baltimore $109.00
Chemically bonded, Baltimore 97.50

Grain Magnesite *St. ⅝-in. grains*

Domestic, f.o.b. Baltimore in bulk fines removed $64.40
Domestic, f.o.b. Chewalah, Wash., Luning, Nev.
in bulk 38.00
in sacks 43.75

Dead Burned Dolomite *Per net ton*

F.o.b., bulk, producing points in:
Pa., W. Va., Ohio $14.50
Midwest 14.00
Missouri Valley 13.65

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill. Price, net ton; Effective CaF_2 content
72½% $44.00
70% or more 42.50
60% or less 38.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron, c.i.f. New York, ocean bags ... 11.25¢
Canadian sponge iron, del'd. in East ..... 13.0¢
Domestic sponge iron, 98+% Fe, carload lots ..... 18.0¢
Electrolytic iron, annealed, 99.5+% Fe ..... 44.0¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe 60.0¢
Hydrogen reduced iron minus 300 mesh, 98+% Fe..63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 mieron, 98%, 99.8+% Fe..83.0¢ to $1.48
Aluminum ..... 31.5¢
Brass, 10 ton lots .....29.50¢ to 36.50¢
Copper, electrolytic ..... 43.50¢
Copper, reduced ..... 43.50¢
Cadmium, 100-199 lb 95¢ plus metal value
Chromium, electrolytic, 99% min., and quality, del'd... $3.60
Lead ..... 21.00¢
Manganese ..... 57.0¢
Molybdenum, 99% $2.75
Nickel, unannealed ..... 89.50¢
Nickel, annealed ..... 96.50¢
Nickel, spherical, unannealed 93.50¢
Silicon ..... 43.50¢
Solder powder..7.0¢ to 9.0¢ plus met. value
Stainless steel, 302 ..... 91.0¢
Stainless steel, 316 ..... $1.10
Tin .....14.04¢ plus metal value
Tungsten, 99% (65 mesh) .. $4.65
Zinc, 10 ton lots .....17.5¢ to 25.0¢

Ferroalloy Prices

(Effective Apr. 6, 1954)

Ferrochrome

Contract prices, cents per lb contained Cr, lump size, bulk, in carloads, delivered.

66-72 Cr, 2% max. Si.

0.025% C	34.50	0.20% C	33.50
0.06% C	34.50	0.50% C	33.25
0.10% C	34.00	1.00% C	33.00
0.15% C	33.75	2.00% C	32.75

65-69% Cr, 4.9% C 24.75
62-66% Cr, 4.6% C, 6-9% Si 25.60

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60.65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads 25.85
Ton lots 28.00
Less ton lots 29.50

High-Nitrogen Ferrochrome

Low-carbon type 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C $1.18
0.50% max. C 1.14
9 to 11% C 1.11

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed, lump 4-in. x down, bulk 2-in. x down, 24.75¢ per lb of contained Cr plus 10.80¢ per lb of contained Si.

Bulk 1-in. x down, 24.90¢ per lb contained Cr plus 12.69¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, lump delivered.

30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads 19.00
Ton lots 22.10
Less ton lots 23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads 20.00
Ton lots 22.30
Less ton lots 23.30

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots 17.50
Less ton lots 19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots 16.60
Ton lots 18.10
Less ton lots 19.35

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed 17.50
Ton lots to carload packed 18.50
Less ton lots 20.00

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 75 pct Mn;

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland Ore.	10.00
Clairton, Pa.	10.00
Sheridan, Pa.	10.00

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk 12.50
Ton lots, packed 14.05

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$84.00
19 to 21%	3% max.	86.00
21 to 23%	3% max.	88.50
23 to 25%	3% max.	91.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed 36.95
Ton lots 38.45

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads 30.00
Ton lots 32.00
250 to 1999 lb 34.00
Less than 250 lb 37.00
Premium for hydrogen-removed metal 1.50

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ..... 21.35¢

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	30.00	31.85	33.05
0.07% max. C	27.95	29.80	31.00
0.15% max. C	27.45	29.30	30.50
0.30% max. C	26.95	28.80	30.00
0.50% max. C	26.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30	26.50

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.

Carload bulk 11.00
Ton lots 12.65
Briquet contract basis carlots, bulk delivered, per lb of briquet 13.65
Ton lots, packed 14.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $92.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $89.50. Add $1.00 per ton for each additional 0.50% Si up to and including 17%. Add $1.45 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton Lots	Carloads
98% Si, 2% Fe	20.10	18.00
97% Si, 1% Fe	20.60	18.50

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk 6.30
Ton lots 7.90

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	13.80
50% Si	10.80	85% Si	15.55
65% Si	12.20	90.95% Si	17.00

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrovanadium

35-55% contract, basis, delivered, per pound, contained V.

Openhearth ..... $3.00-$3.10
Crucible 3.10- 3.20
High speed steel (Primos) 3.20- 3.25

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis f.o.b. Suspension Bridge, N. Y.

Carloads 9.90
Ton lots 11.30

Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.15

Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots $9.50
Less ton lots 9.55

Ferro-Tantalum-Columbium, 20% Ta, 40% Cb, 0.30% C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $4.75

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo $1.31

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., 24.00 unitage, per gross ton $90.00
10 tons to less carload $110.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagra Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots 1.55

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton $177.00

Ferrotungsten, ¼ x down, packed, per pound contained W. ton lots, f.o.b. $2.00

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. $1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.13

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound

Carload, bulk lump ..... 14.50¢
Ton lots, bulk lump ..... 15.75¢
Less ton lots, lump ..... 16.25¢

Vanadium Pentoxide, 86-89% V_2O_5 contract basis, per pound Contained V_2O_5 ..... $1.25

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.

Ton lots ..... 21.00¢

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.

Carload, bulk ..... 8.00¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B... $5.25

Bortam, f.o.b. Niagara Falls

Ton lots, per pound ..... 45¢
Less ton lots, per pound ... 50¢

Corbortam, Ti 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4-5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots per pound ..... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, Ton lots ... $1.30
F.o.b. Wash., Pa.; 100 lb up

10 to 14% B ..... .85
14 to 10% B 1.30
19% min. B 1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over

No. 1 ..... $1.00
No. 6 ..... 65¢
No. 79 ..... 50¢

Manganese-Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots $1.45
Less ton lots 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% Max C, 3.00% max. Fe, balance Ni, delivered

Less ton lots $2.05

Silcaz, contract basis, delivered

Ton lots ..... 45.00¢